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MEDICAL SCIENCE.

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PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Disease as affecting Success in the War.*[a] By LIEUT.-GENERAL SIR CHARLES BURTCHAELL, K.C.B., C.M.G., D.G.M.S., British Armies in France.

IN the early days of the war one was impressed by the fact that many members of the Medical Profession on entering into Army service from practice in civil life had viewed cases of sickness and disease from a different standpoint to that of a commander of a fighting force. In civil life they were apt to look at each case mainly from the point of view of the interests of the particular individual whose condition they had to assess and treat, whereas in an army it was essential to the success of the military operations to look at disease and physical non-effectiveness from a collective point of view and to endeavour by every possible means to maintain the fighting troops at the highest possible figure of effective strength. This required not only up-to-date and progressive knowledge of the scientific methods for the prevention and treatment of disease in an army under

[a] Read before the Section of Medicine in the Royal Academy of Medicine in Ireland, on Friday, March 7, 1919.

the various limitations imposed by the circumstances of war, but also a knowledge of human nature as seen in a military community and of the psychological factors which influenced a soldier's life and duties.

From the outbreak of the war and throughout the long period during which hostilities continued, representatives of all grades of the civil Medical Profession threw themselves whole-heartedly and regardless of sacrifice of private interests into the cause of the Army and the Empire. From the first there was admirable co-operation between the temporary and regular officers of the Royal Army Medical Corps, but it took time and experience before there was a sufficiently widespread understanding of the common aim to ensure that the extensive range of technical and scientific knowledge available was pulling to full weight in the prevention, investigation, and treatment of disease.

Theoretically in the past every man passed into Military Service was supposed to be in sound physical condition, but the supply of individuals perfect in every way was not sufficient to meet the requirements of the Army and consequently large numbers of men, mostly of inferior physique, were accepted for service with defects more or less definite and serious from a military point of view. Thus there was a constant outcrop of disabilities which did not originate from Military Service. Though much could be—and was—done by the initiative and energy of regimental medical officers to keep up the efficiency of originally defective men and retain them in the ranks, it was this class which caused an appreciable proportion of wastage or sick wastage of an unavoidable type. But if we take the ideal man absolutely fit on enlistment the Medical Service had a great responsibility in protecting him from disease that could in any way be prevented. Without foresight, organisation, adequate food and clothing, and constant attention to the application of sanitary measures for checking the onset and progress of infectious disease an army might perish even before it was in contact with the enemy.

There had been some instances of this in military history, and in nearly all past campaigns the casualties through the effect of enemy weapons were much less than the losses from sickness. During the recent great war this was not the case, and although during the winter months hardship and the results of exposure resulted in a certain amount of sickness, at no time did any of those infectious diseases which decimated armies in former wars make any headway. The epidemic diseases which took a prominent place in the Medical History of the British Army formerly were typhus and enteric fevers, cholera, and dysentery.

In the Army in France there had been no case of cholera, but on several occasions the Intelligence Department gave warning of its presence in various sectors of the Austrian and German Armies. All possible precautions necessary to prevent the extension of the disease to the British troops were adopted and the necessary arrangements were made for coping with it should it occur. Cholera outfits with instructions for the treatment of the disease were stored and kept ready for issue; fortunately these were never required.

Typhus.—I do not believe that there has been a single case of true typhus fever in the army—a few suspected cases were reported. These were interesting to anyone who had been students in Dublin, where up to recent years there were ample opportunities of becoming acquainted with the disease. Very few medical men serving in the army had ever seen a case of typhus, and in one instance where a suspected case was reported the services of a medical officer who had studied in Dublin, and had been a resident physician at Cork Street Fever Hospital, had to be secured to give an opinion. He did so, and pronounced against the case being one of typhus. Another suspected case which was brought to his personal notice turned out to be a case of scabies with a co-incident temperature of an indefinite origin.

Enteric Fever.—We are all aware of the ravages this fever made amongst British troops in South Africa and

in Volunteer Camps of the Spanish-American war. In France the medical authorities were always on guard lest it should attack the troops and spread. During the last ten years inoculation had been very satisfactorily carried out in the British Army at home and abroad, and very few soldiers of the old regular army went to France who had not been inoculated. The majority of the new men were also inoculated. In South Africa, before inoculation was extensively practised, there were 57,000 cases of enteric with 8,000 deaths. In the Army in France during the whole period of four years of war there were 7,352 cases with 280 deaths. It was difficult to arrive at a correct figure of the strength of the troops in France off which to calculate rates per 1,000 owing to the flow of men to and from the United Kingdom, but the average might be taken as one million and a half, a figure which is on the low side, whereas the strength in South Africa was less than half a million. These figures included all types of enteric organisms. Of enteric fever alone, excluding para-typhoids, there were slightly over 2,000 cases with 204 deaths. The death rate amongst inoculated men averaged 4 to 5 per cent. Amongst the uninoculated the death-rate was about 18 per cent., so that inoculation has done what had been claimed for it. But in considering this low incidence one has to take into account that there were other factors in operation besides inoculation, which might have had an effect in keeping the disease in check—the sanitary arrangements and the chlorination of drinking water. All drinking water was supposed to be chlorinated and the orders on the subject were well carried out on the whole, but no doubt there were many instances where men did not drink water which had been so treated. The French Army had a severe epidemic of enteric in 1914, which appeared to be due to a faulty vaccine not having given the necessary protection.

Dysentery.—This disease appeared in 1916. In 1915 a few cases were reported, but it was not until 1916 that the disease attracted attention. It was probably intro-

duced by troops from the East, but it never spread to any great extent. It occurred at the same period of the year on each occasion, that is, between the middle of July and the end of September—the hottest time of the year. The number of cases was about the same in 1916 and 1917, and the number was doubled in 1918. It was controlled by keeping every suspected case under observation and subjected to bacteriological tests until declared free from infection. Men were sent from the forward areas to isolation hospitals at the bases, where a bacteriological examination was made. Many suspected cases so transferred turned out not to be dysentery and might quite well have been left in forward areas. During the last year (1918) more attention was given to the clinical features, and cases, when possible, were bacteriologically examined in the front areas, and only those men were sent to the base who showed evidence clinically or bacteriologically of true dysentery. They then had to undergo three different bacteriological examinations before being declared clear of the disease.

A certain number of "carriers" were detected and they may have been more common than was at first thought probable. It seemed likely that the mild cases on discharge from hospitals were not so dangerous as some authorities supposed, provided that they were kept under observation and not allowed to handle food supplies.

Cerebro-Spinal Fever.—This disease appeared early in 1915, probably by extension from the South of England, in which district it was prevalent amongst troops in camps into which it was introduced by troops from North America. It never spread to any serious extent in the Army in France, and had practically no effect on the strength of the troops. Still it was the disease of all others that was very fatal and very serious from a point of view of possibility of extension. On one occasion early in 1917 some 40 or 50 cases occurred at one base where there were a very large number of men, and the outbreak caused considerable anxiety. Every precaution was adopted, cases and contacts being carefully isolated.

An interesting point in connection with the cases originating in the front line was the fact that a second case never occurred in the same billet or dug-out. When a case was reported from a particular trench the next would, as a rule, come from a trench a considerable distance away. This was very remarkable, and there was no evidence that the disease had been spread or conveyed by personal contact. Although the disease did not affect any great number of men at any one time the Army was never entirely free from it, and throughout the war usually two or three or five cases occurred each week in France. Valuable research work was carried out by various workers. The results of serum treatment were not very successful, but they improved when the measures were taken to determine the type of meningococcus present in each case and to produce a corresponding serum.

Ordinary Measles and *Diphtheria* were always present in the Army; but they never were of any great importance in relation to the strength of the troops. About twenty-five cases of diphtheria occurred every week. Measles generally had a high curve in the Spring, when the weekly admissions averaged about 40; on one occasion they ran up as high as 70, but at a time when the strength of troops was also high.

Smallpox.—Only about 12 cases of smallpox occurred during the war amongst the British troops. There was a small epidemic amongst the civil population at Rouen on one occasion—a few soldiers there contracted the disease, and some interesting points supporting the efficacy of vaccination along the well-known lines were observed.

Trench Fever probably had the highest incidence of any definite disease, and the cause of the greatest wastage from the front line. A recurrent type of fever was observed early in 1915. It took some time to discover its exact nature and characteristics. Much research work was carried out, and eventually it became evident that a new specific disease was present. All probably know the history of the subsequent investigations. In France

a British Committee working in association with a Committee of the American Army under Major R. P. Strong established the fact that infection was conveyed by lice. Volunteers from the American Army Corps came forward for inoculation for experimental purposes. More recently the infecting organism—a filter passer—was isolated and grown by Major Wilson, R.A.M.C., whose results have recently been published, and further work is at present in progress to solve the problem of immunisation.

With the cessation of hostilities the disease, for the moment at all events, ceased to be of any immediate practical importance, as it was only under the conditions of trench life that there were real difficulties in keeping troops free from lice. Much progress had been made at the time of the Armistice in delousing, and had the war continued there was a probability of being able to keep men sufficiently free of lice to reduce the incidence of trench fever to a low figure.

Malaria.—In the summer of 1918 a large number of troops were transferred to France from Salonika and Palestine. Of these over thirty thousand were or had been infected with malaria, and their general condition and liability to relapse rendered them temporarily unfit to fight. A similar class of case had been sent to England during the two previous years from Salonika not as invalids in hospital but as ordinary troops useless for fighting purposes owing to frequent attacks of malaria. In England they were kept under supervision, treated with quinine, and taken into hospital only when necessary. The measures adopted did not succeed in getting many back to duty. Large numbers of the men sent to England in the first instance were subsequently sent to France when camps and suitable arrangements had been organised to deal with the malarias arriving direct from the East. The Army was pressed for reinforcements at that period of the war and it was of the highest importance that everyone should be made fit in the shortest possible time. It was decided that, if quinine was administered as advised by Ross and others by the mouth, and if continuity were ensured in every

case and the men were kept under favourable conditions, they would probably get well rapidly.

The whole of these malaria troops were placed in special camps under the control of an Administrative Medical Officer specially selected on account of his experience of the disease. He was given a free hand in all the arrangements, and the officers in command were instructed that the orders of this Administrative Medical Officer and his medical officers in questions relating to duties, drills, exercises and conditions of life of these men were to be carried out without fail, and that under the supervision of the medical officers quinine was to be administered on parade to all ranks. In about two months practically all of these troops were free from relapses and they were fit enough to form the greater part of two divisions. These two divisions fought in the last battle with the most conspicuous success. Our experience was that when the administration of quinine was absolutely ensured in every case, and when the men were kept out of doors and suitably exercised, the relapses ceased and the general health improved. The reason that the men did not get well in England was that they were frequently admitted to hospitals for relapses and often kept on in hospital for weeks without continuous treatment with quinine either there or when they came out. This was due to certain difficulties in effecting concentration and control. The routine was to give 60 grains of quinine per week. Whether good results would be obtained with a lesser amount was not certain. There was not time to carry out experiments on that point in France, where success depended upon close supervision of the administration of the drug.

Influenza first made its appearance in the Armies in May, 1918. It corresponded in type and characteristics with the epidemic in other parts of Europe. When first seen in the Army in May the type was very mild but the attack was very extensive. At that time some 250,000 men took the disease in the course of two to three months, each of them being from four to seven days ill. They re-

covered rapidly and, as a rule, without the weakness which generally followed an influenza attack. But the great number attacked and temporarily ill at one time in June, 1918, was a very serious consideration from a military point of view. I do not think the disease passed off altogether; but by the end of July it became reduced down to a figure that was not important as a military factor.

Early in October we knew it was coming again amongst the troops. We had had reports from Spain in September which showed that a recrudescence of the epidemic was raging in that country, and it was fairly certain that it would be impossible to prevent it from reaching the British troops as it had in May. During October this second wave rose rapidly, and it soon became evident that the cases were of a more severe type than in the previous one, mainly owing to the high incidence of lung complications, which caused a very high death rate. Although the total number of men that took the disease in the autumn and winter was only about a third of the number attacked in the summer off the same strength, the mortality rate was high and was a more serious factor than the number attacked. Information as to the nature of the disease was circulated, and orders for the isolation of all cases of broncho-pneumonia were issued. The medical authorities also endeavoured to prevent cases being transferred from one point to another. It was very difficult to control such movements, which were often unavoidable, because at that time the Army was moving up to the Rhine, and there was a constant stream of men marching east to Germany. Men taken ill on the march had to be provided for in villages where there were but scant facilities for treating them. The railways were destroyed, and where they were open the congestion of traffic did not give the required freedom of movement. Whenever possible, arrangements were made to send up additional doctors and nurses to take charge of groups of patients at defined points near where they fell ill as against transfer to distant hospitals. This had an influence in reducing the number of cases that developed

pneumonia, and it certainly reduced the number of deaths. The disease was at its highest on the 27th October, when the total daily admissions reached over 2,000 and the case-mortality of all cases with or without pneumonia was between five and six per cent. The admissions fell steadily until the 27th of December, when they averaged about 200 daily. There was a corresponding reduction in the number of deaths. This level was maintained up to the 27th of January, 1919, when the cases began to increase again, and in the course of ten days the admissions were up to 1,100 a day. The case-mortality remained about the same as before, about 5.5 per cent. During the last days of February there were indications that the number of fresh cases was falling.

As regards direct infection they had very few instances where one could say that septic-pneumonia had been directly transmitted to a neighbouring patient. Numerous instances had occurred in wards containing a large number of men where the new cases which developed broncho-pneumonia were in beds at a distance from those containing patients with that condition. Attendants took the disease, but one could not say that it was more common amongst the attendants in contact with influenza cases than amongst those who were not. As regards an attack giving a protection or not against a second attack—there was a wide difference of opinion amongst Medical Officers. There was some evidence of a temporary immunity in the case of Prisoners of War Companies, some of which were completely isolated and worked independently and did not mix up with others. Companies that had taken the disease in May did not take it in the winter and *vice versâ*. Vaccine as a preventive or curative agent was not successful during the epidemic.

Much interesting and valuable research work was done by several officers, but the results so far had not reached a stage where their practical application was of importance. The work of Major Wilson on the filter passing organism isolated from influenza cases has recently been

published, and it is hoped that this will lead up to an effective means of immunisation and treatment.

Trench Nephritis.—Towards the end of the winter, 1914-1915, the number of cases of nephritis coming from the trenches became noticeable. Investigations were started, and it was thought by some that a specific disease with a definite organism was present. A committee was formed to investigate the condition, and excellent work was done by various workers associated with it. The most interesting piece of work was probably that done by Captain McLean in his investigations into the presence of albumen in the urine of healthy men. Recently the work of Wilson and Bashford on filter passers tends to confirm the view that there was a specific infecting organism in trench-nephritis. The condition was of great medical interest but its incidence was not very important in relation to other causes of wastage in an Army. The cases were not confined to men serving in the trenches.

The *Poison Gases* used by the enemy were responsible for a considerable amount of loss. They produced many conditions of medical interest and probably some of the results of gas, especially when chlorine was first used in 1915, were the most distressing that a medical man had to deal with. Many men were killed outright in the trenches. The only true protection was in masks, which were soon brought up to a very effective type. Chlorine, phosgene and mustard gas (dichlorethyl-sulphide) were the gases most used. The effects varied according to the gas used and the resulting conditions often lasted for a long time and were a source of considerable inefficiency. I hope we shall never see any kind of poison gas used in warfare again.

It was the very first war in which a vast Army had gone through a very long campaign without an epidemic of some form of infectious diseases on a large scale. This, I consider, was partly due to protective vaccination and inoculation, and partly to improved sanitary precautions and an appreciation of their importance by commanders and other officers. Improved methods of diagnosis and

the provision of mobile laboratories with skilled bacteriologists also played an all important part. I cannot refer to that part of the medical organisation without mentioning the name of Major Adrian Stokes, of Dublin, who has done so much brilliant work both as a pathologist and as an investigator of disease.

There are, of course, many medical diseases other than infectious disease which are always present in an army and were a fertile source of inefficiency. For instance, indefinite cardiac conditions, skin diseases, &c., which are to a great extent preventable. Then there were nervous diseases and psycho-neuroses and the so-called "shell-shock." Under this last designation one saw all kinds of conditions, and in some instances men said to be suffering from the complaint had never been in the firing-line at all. This was only to be expected seeing that a large number of men who joined the Army were temperamentally unfitted for a soldier's life. Such men got into a nervous state before they came under fire. Great bodies of men suffered from nervous exhaustion after prolonged periods of strain in the firing line, and for a short time after coming out of the trenches they were incapable of doing duty. But provided the men were originally sound and normal in their nervous system they became quite fit after a period of rest.

I would conclude by paying a tribute to the Dublin Hospital in Boulogne. It was with great regret that the Medical Authorities in France parted with the unit owing to a misunderstanding as to its connection with the conditions of service applicable to certain Territorial Force units.

ART. II.—*Some Points about Bone Grafts.*[a] By LIEUT.-COLONEL SIR W. I. DE C. WHEELER, F.R.C.S.I., R.A.M.C.; Surgeon, Mercer's Hospital, Dublin.

FOUR years of war have provided such a plethora of material for the study of bone-grafting operations that it is possible for surgeons to survey the field from the standpoint of considerable experience. Heretofore discussions

[a] **Read before the Section of Surgery in the Royal Academy of Medicine in Ireland on Friday, November 8, 1919.**

Plate I.

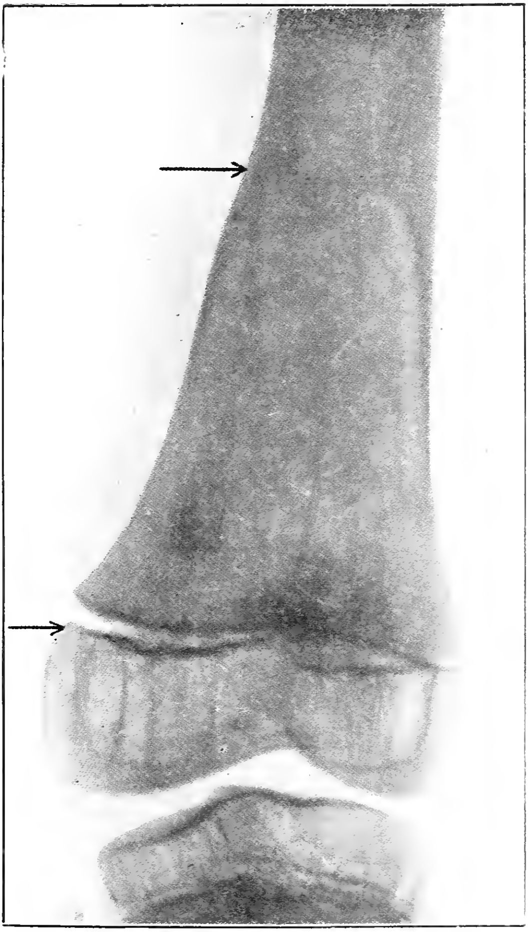

Fig. 1.

Recent x-ray of case operated on in 1909. The lower third of the shaft of the femur was removed (between the arrows) and was accurately re-formed as shown.

Plate II.

Fig. 2.

Portion of bone removed, regeneration shown in Fig. 1.

Fig. 3.

Bones of forearm on admission. Great angular deformity and shortening

PLATE III.

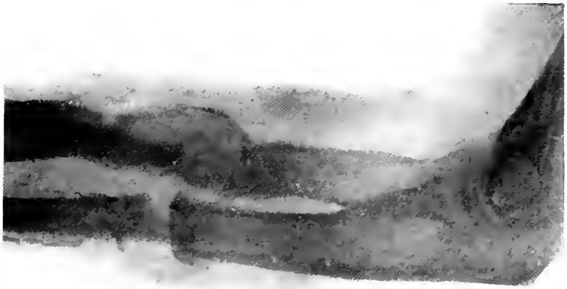

FIG. 4.

Reconstruction of the forearm shown in Fig. 1 by resection of bone, plate, and wires *en bloc*, and bridging of gaps with intramedullary pegs. The radial peg increased in diameter to size of normal radius after six months.

FIG. 5.

Gunshot wound of lower end of humerus before operation. Temporary musculo-spiral paralysis disappeared *pari passu* with the healing of the wound three months after the injury.

FIG. 6.

After operation. The introduction of a peg-graft four months after healing was followed by lighting up of latent sepsis in the old wound. The graft survived, firm union followed, with full movements at the elbow-joint.

PLATE IV.

Fig. 7. Union of fibula and tibia. Note thickening of fibula, the result of weight bearing. Good functional result.

Fig. 8. Old ununited fracture of humerus

about bone-grafting have centred mainly around theoretical and acaremic questions, such as the rôle of the periosteum in the osteogenetic process, and the ultimate fate of the graft in its new position, the all-important clinical stand-point receiving but scant recognition.

So far as the osteogenetic power of periosteum is concerned, the controversy largely appears to hang round the point, what is meant by the periosteum? If merely the fibrous sheath which surrounds bone, then the periosteum is but a limiting and vascularising membrane. If, on the other hand, the cambium or epiosteum layer lying between periosteum and bone, and rich in osteoblasts, is included as part of the periosteum, then most certainly the periosteum plays an important part in the production of bone. This bone-producing layer, lying between the periosteum and the surface of the bone, clings in children to the periosteum, whereas in adults it appears to belong more properly to the bone, and, in the absence of trauma or inflammation, to be inseparable from it.

If the periosteum is preserved, with its clinging osteoblasts, as in the case of subperiosteal resection of bone in a child, new bone will be formed with mathematical accuracy in every case (Plate I., Figs. 1 and 2). In adults subperiosteal resection may or may not be followed by new bone formation, the result apparently depending to a large extent on whether or not the osteoblasts are detached from the bone in the process of separating the periosteum.

From a practical point of view absence of the periosteum from an implanted bone graft probably means slower vascularisation and a more prolonged convalescence for the patient. The retention of periosteum with the graft is not essential for success, but appears to play a decided part in the formation of an involucrum of new bone, which is seen with comparative regularity round a graft a few weeks old. Periosteal covered grafts are more permanent, and less likely to be absorbed.

Murphy and others held that the graft was nothing more

or less than a scaffold, which is replaced by new bone. When the graft was contacted with living bone, the Haversian vessels permeated the Haversian canals of the graft, and carried with them osteoblasts and osteoclasts. The osteoblasts made good the defects in the graft produced by the activity of the osteoclasts. Thus the osteoblast produces and inserts a new brick *pari passu* with the demolishing of the old structure by the osteoclasts. That the graft is not mere scaffolding removed by the action of the osteoclasts and replaced by the activity of the osteoblasts, but is really viable and inherently carries its own osteogenic powers, becomes obvious under certain pathological conditions.

If a fracture occurs, the result of accident, the graft unites by the formation of callus, by a process simulating the repair of normal bone, and if a graft becomes infected, and the infection is not sufficiently severe to kill it outright, then an involucrum and sequestrum may be formed (Plate XV., Fig. 27). In other words, almost from the time of insertion, a graft behaves in a manner identical with ordinary bone.

Sir Robert Jones illustrates a case of bone-graft introduced to replace a tibia lost from disease. The graft broke near the centre, but subsequent *x*-ray photographs demonstrated a very definite formation of callus at the site of fracture.

Experience teaches many interesting points in connexion with the surgery of bone-grafting. Ruin is not inevitable if accidental infection follows the operation, either through error of technique or the result of latent sepsis. A graft will often survive all but the streptococcal and other severe infections, and a bacteriological investigation should be made of the pus, in order to gauge the prognosis. Technique should approach perfection in every surgical operation, but should infection occur, or from the nature of things be inevitable, a bone-graft will withstand the assault in a surprising manner, and the end results may be admirable (Plate III., Figs 5 and 6).

PLATE V.

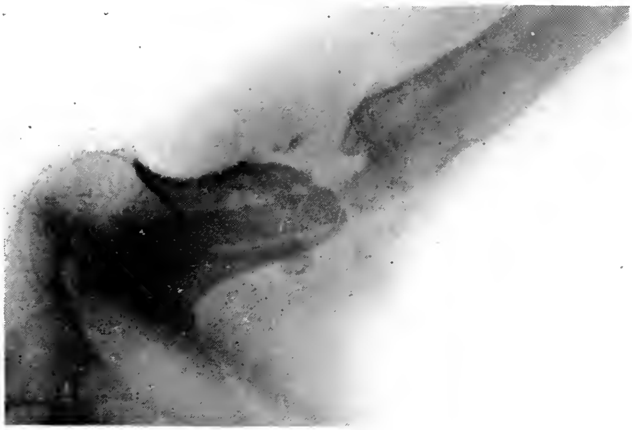

FIG. 10.
Illustrating fracture of peg graft in old fracture of humerus.

FIG. 9. Repair by peg bone graft 15 months after accident.

PLATE VI.

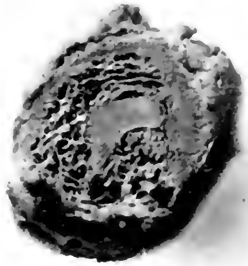

FIG. 11.
Section of Bone removed six months after a peg graft operation. Note the firm incorporation of the peg with surrounding bone.

FIG. 12. Fracture of humerus eight years' standing—on admission.

PLATE VII.

FIG. 13.

Long inlay graft in ununited fracture of the humerus of eight years' standing. Six months after operation there was absorption of the graft in the "critical area" and failure of union.

FIG. 14.

Fracture of humerus with peg graft held in position by bone nails made with Albee's electrical lathe.

PLATE VIII.

FIG. 15.

One of a series of cases of old fracture of the radius with marked radial displacement of the hand and prominence of the head of the ulna. A portion of the ulna has been removed to correct alignment.

In proof of this we have only to watch the completely separated fragments of bone in a compound "ploughed" fracture the result of gunshot wound, and see the fragments not only remaining viable, but rapidly consolidating with the fractured ends during repair. It is not true to suppose that bare bone is of necessity devitalised and will end in sequestration in a septic case, and the same observation applies to a bone-graft. Hence the golden rule not to remove loose fragments in the early treatment of septic fractures, nor disturb a bone-graft because unexpected infection follows the operation.

In fifteen cases of Albee's operation for Pott's caries during the last five years the wound twice became infected. In one case, a child seen by Professor Osgood when visiting Dublin, the graft protruded through the lower angle of the wound for some weeks, without any sign of local inflammation in the soft tissues. Eventually the protruding portion was removed with bone pliers, and the skin at once healed across the gap leaving the main portion of the graft undisturbed. This case recovered rapidly, with the graft firmly consolidated *in situ*.

In the second case, a very thin young adult, a pressure sore developed from insufficient padding of the frame on which the patient was placed after operation. The lower third of the graft became exposed, and the wound suppurated freely. In twelve months' time a sequestrum was thrown off, and the wound healed. X-ray photographs showed the graft *in situ* and firmly fixed to the diseased segment of the spine (Plate XV., Fig. 27). The result was admirable.

The first thought of the surgeon must be how to fix the graft in its new bed and by what method the limb is to be immobilised immediately after operation. A small amount of movement does not delay union in a simple fracture, as evidenced by the rapid repair of a broken rib or jaw, but the slightest mobility in a bone-graft may make all the difference between success and failure.

In planning the line of the incision there will be no diffi-

culty in dealing with easily accessible bones, such as the ulna and tibia, but in the case of the humerus and radius real respect must be paid to anatomical structures. Cases operated on previously, and exhibiting many scars, require ingenuity in planning the operation, so as to avoid, *inter alia*, the musculo-spiral and posterior interosseous nerves. The best plan is to expose the bone in its most easily accessible portion and then to extend the dissection by keeping under the periosteum, or as close to the bone as possible. The less the muscular attachments are interfered with the more rapidly will the osteogenetic process be established. Ruthless stripping of the bone must be avoided.

In old ununited fractures the difficulty at once arises of how to prepare a bed for the graft in the presence of, perhaps, two or three inches of sclerosed non-vascular bone. Complete resection often cannot be done without undue sacrifice of the length of the limb. In such cases reliance may be placed on a long stout graft extending for a considerable distance above and below the sclerosed area, and an attempt made to create vascular channels by drilling holes and reaming out a new medullary cavity before placing the graft in position. (Plate IV., Fig. 7).

A long stout inlay graft is most likely to succeed, but it should be remembered that the recipient bone in the *critical area*—that is, the region of the fracture—is unsuitable soil; osteogenesis and thickening of the graft may fail, and the solution of continuity reappear on absorption of the graft many months after operation (Plate VII., Fig. 13). Radical shortening of the bone is the only remedy if grafting fails, and in the case of the humerus gives a good functional but poor æsthetic result. The operation should for choice take the form of "the step" coaptation recommended by Hey Groves.

In old cases a sliding graft, taken from above or below the site of fracture, must not be used; the lower or upper end of a graft so taken would consist of sclerosed bone,

PLATE IX.

FIG. 16. Same case showing regeneration of the ulna with desired deviation.

FIG. 17. Final result. The radius has been grafted. The wrist is in dorsiflexion with slight movement.

PLATE X.

FIG. 18. One of a series of old fracture of the ulna. The deformity of the [illegible]

FIG. 19. Graft in position. The peg is not quite long enough above. Result good.

PLATE XI.

FIG. 20.
Old fracture of ulna.

FIG. 21. Failure of graft from slight injury. The graft was placed in a lateral groove above and pegged into the lower fragment.

Plate XII.

Fig. 22.

Same case after removal of graft some months later. New bone subsequently filled the gap with excellent result.

non-vascular and devitalised by prolonged inflammatory changes. Sliding grafts should be reserved to bridge a fracture in recent simple cases, and even then should be sparingly employed; they are frequently too short and insecure (Fig. 25).

The intramedullary peg is condemned by many, but it provides the simplest form of bone-graft, and in the late J. B. Murphy's hands it gave excellent results, the peg becoming firmly incorporated with the bone into which it was inserted (Plate VI., Fig. 11). In one case an ununited fracture of the humerus of eight years' standing, the upper portion of the peg failed to unite, and gradually formed a species of ball-and-socket joint within the medullary cavity, but there was firm incorporation of the lower end of the graft with the recipient bone. At a second operation, three months afterwards, it was found impossible to remove this portion of the graft without the free use of the chisel.

There is one obvious difficulty in the introduction of a peg-graft, for if half be driven into the medullary cavity of one fragment it is impossible to complete the introduction of the other without undue traction of the limb. To overcome this difficulty, the end of the graft which protrudes from the medullary cavity of one fragment should be laid in a groove cut in the other during traction of the limb. When the traction is relaxed the end of the peg glides past the groove into position. The alignment is of necessity perfect.

It must be remembered that overstrenuous traction of the arm in a case of ununited fracture of the humerus will produce transient musculo-spiral paralysis, and give rise to anxiety for two or three months. The peg-graft is admirable if it were not for the real danger of fracture during convalesence. (Plate V., Fig. 10). This accident has occurred over and over again notwithstanding the greatest care in applying splints and plaster dressings. Owing to this liability to fracture, the use of peg-graft may with advantage be confined to cases of fracture or defect in the bones of the forearm (Plates II. and III.,

Figs 3 and 4), and more stable lateral inlay grafts be reserved for the repair of femur and humerus.

Injury to the radius or ulna is followed often by pronation deformity, the correction of which is an important part of the preliminary treatment. An intramedullary peg in the radius will not be disturbed by the coaxing of the lower fragments into a supinated position, although, whenever possible, every deformity should be corrected before operation is undertaken. When an inlay-graft is employed it is a simple matter to lay the upper end in a groove of the proper dimensions and then push it for a short distance into the medullary cavity above; but in this case the lower end may tend to spring away from the lower fragment, and some means must be adopted for its fixation. Surrounding the bone by two or three heavy catgut ligatures tightly tied round the graft suffices in most cases, provided the rigid fixation of the limb is afterwards ensured.

By some, reliance is placed on the rigid fixation of the graft *in situ* by mechanical aids, and early movements of the limb are encouraged to stimulate the activities of the bone (so well seen in children) according to Wolff's law (Fig 7). By others the graft is so arranged that success entirely depends on the fixity supplied by the splint or plaster cast, and no movement is allowed for at least three months. All are agreed that unless the graft lies in its bed incapable of movement the operation is certain to fail.

In the hands of Lane, Hey Groves, and others, as might be expected, excellent results follow the use of plates, bolts, and screws in combination with grafts. This procedure, however, prolongs and complicates the operation, and I am frankly afraid of disappointments in attempting too much. Bone nails can be readily made with the lathe and appliances provided with the Albee electro-motor saw, and the graft can be thus secured in position. It is fascinating but tedious work. I have twice fixed the graft with a series of bone nails, but the operation appeared to me to be unduly prolonged (Plate VII., Fig. 14). By making the graft a tight fit for the groove and

PLATE XIII.

FIG. 23.

Old fracture of the radius grafted by Major M'Cullagh. Firm consolidation of graft.

PLATE XIV.

FIG. 25. Same case, with deformity corrected and held in

FIG. 24.

PLATE XV.

FIG. 26.

One of a series of 15 cases grafted for Pott's caries in adults—all these cases recovered and are apparently cured.

PLATE XVI.

FIG. 27.

Sequestrum removed from spinal graft a year after operation. There was infection from a bed sore. This did not retard complete recovery.

hammering it into position reasonable fixation can also be secured.

In all my cases (except two) the graft, consisting of periosteum, compact bone, endosteum, and marrow, was taken in the orthodox manner from the subcutaneous surface of the tibia by means of Albee's twin electro-motor saw. In the two cases—one a congenital dislocation of the hip, and the other caries of the spine with much deformity—a rib-transplant was found most suitable in size and shape.

A note of warning is necessary regarding fracture of the tibia from which a graft has been taken. This may occur some months after operation. As a precautionary measure a light plaster casing should be employed, and the use of crutches encouraged until strength of the leg is assured. There is little risk of this accident if the strong crest of the tibia is avoided in taking the graft.

Hey Groves expresses the thought of most workers in this branch of surgery when he states that his "feelings are those of disappointment and hope—disappointment that the proportion of successes has been so small, and hope that by the experience gained one may be able to avoid causes of failure, which are seen to be so obvious, and therefore so possible of evasion."

From the above remarks, based on a study of many cases, it may be concluded that—

1. Whatever the histological rôle the clinical usefulness of a bone-graft is not affected.

2. The final success of bone-grafting in cases in which a gap is bridged depends upon the operation of Wolff's law (Plate III., Fig. 5)—that is, the graft, stimulated by strains and stresses, changes its internal architecture and external conformation until the required strength is attained. In other words "the amount of growth in a bone depends on the need for it" (Murphy): (Plate IV., Fig. 7).

3. The periosteum should be left on the graft, because, although not essential, it is the medium through which new blood vessels enter the graft and the surrounding

structures. Furthermore, in removing the periosteum superficial layers of osteoblasts may be sacrificed. A periosteum-covered graft is less likely to become rapidly absorbed.

4. To provide the necessary strains and stresses it is advisable to allow the graft to functionate as early as possible, but in most cases preliminary fixation for three months is essential.

5. In old ununited fractures with false joints the bone in the critical area near the site of fracture is sclerosed and non-vascular, and makes an unsuitable soil for that portion of the graft in contact with this area. Growth in the graft is impeded by the surrounding sclerosis. Dense sclerotic bone has no osteogenetic power.

6. In such cases a periosteal covered graft, instead of exhibiting osteogenetic powers and responding to Wolff's law, may become attenuated and absorbed or break in the critical area five or six months after operation (Plate VII., Fig. 13).

7. In the same class of case very prolonged fixation is particularly unfavourable to osteogenesis, to the establishment of blood supply, and bony union. Early movements and the bearing of mechanical stress and strain, on the other hand, may lead to yielding of the graft and failure. The problem is a difficult one in the case of the humerus or femur, where strength is essential from the commencement of treatment, but may be solved by wide resection of the sclerosed bone, and resignation on the part of the patient to a short limb.

8. But for slightly slower osteogenetic powers, and a real tendency to fracture, the intramedullary peg is effective. This method of bone-grafting is satisfactory in the case of the radius and the ulna.

9. In the case of the humerus and femur, long stout inlay grafts give the best results. Sliding grafts should be employed only in simple and fresh cases.

10. The bone-graft has inherent bacteria-resisting properties.

11. Absolute fixation of the graft in its bed, either as

PLATE XVII.

FIG. 28.

Spinal graft in a case of vertebral tuberculosis. This officer returned to active service six months after operation.

FIG. 29.

Fixation of the sacro-iliac joint by a tibial graft in old standing tuberculosis of the joint. All pain disappeared after operation. The X marks the position of the graft.

part of the operation, or afterwards, by splints or plaster, is essential to success.

12. Bone-grafting for spinal caries is followed by more uniformly successful results in adults than is seen elsewhere. This is to be expected, since both the graft and the recipient bed (in the region of the spinous processes) consist of healthy bone.

13. As in the operation of tendon transplantation and nerve suture, the operation of bone-grafting should be preceded by correction of any existing deformity and by the freeing of adhesions in neighbouring tendons and joints.

Fig. 29 shows a peg-graft introduced into the sacro-iliac joint to promote fixation in a case of tuberculous disease. This operation promises well, as the treatment of this joint has heretofore proved unsatisfactory. I am indebted to Dr. Hardman for his endless trouble in connection with the radiographic aspect of my bone-grafting work. Space only permits the reproduction of a few of his plates.

LITERARY NOTE.

A new series of books on Hygiene, the English Public Health Series, written by experts, and dealing with questions of special interest at the present time, is announced for publication by the House of Cassell. It is edited by Sir Malcolm Morris, K.C.V.O., who was a member of the Royal Commission on Venereal Diseases, and has taken a prominent part in the Public Health movement for many years past.

As the introductory volume, he has written "The Story of the English Public Health," a graphic record of the evolution of our system of Preventive Medicine from the beginning down to and including the creation of the Ministry of Health. This is announced for publication on June 26th.

At the same time will be published the second volume of the series, "Infant and Young Child Welfare," by Dr. Harold Scurfield, Medical Officer of Health for Sheffield. This is especially opportune, in view of the Baby Week Conference, to be held at the beginning of July. Other volumes will follow in quick succession.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

Seale Hayne Neurological Studies. Edited by LT.-COL. A. F. HURST, R.A.M.C., &c. Vol. 1. Nos. 1, 2, 3, Humphrey Milford. Oxford University Press. 1918-1919.

THESE studies, the first three of a series, are records of some of the work being done at Seale Hayne Hospital, Newton Abbot, by Lt.-Col. Hurst and his very able staff. The work is the curing of hysteria and other neuroses, but chiefly of hysterical manifestations in soldiers. There is no record of failure of treatment, and there is probably little or no failure to record. At any rate, the author's reports leave on one an impression of vigour, patience, and persevérance in treatment which compel success.

Broadly speaking, the method is this: first, an "atmosphere of cure" is provided, then a correct diagnosis is made, a diagnosis that the morbid condition is wholly or partly hysterical and proportionally curable; then healing influence of some sort—it does not seem to matter much of what sort in the hands of these masters of arms—is exhibited. And cure is the result; often rapid cure even in old-standing cases. Every sort of objective symptom is cured—aphonia, stammering, ptosis, blepharospasm, paralyses, contractures, bladder troubles, sensory troubles, tremors, fits—the record of success becomes positively monotonous! The influence employed does not appear to matter much, provided there be enough of it—suggestion, persuasion, re-education. But psycho-analysis in anything like a Freudian sense is not employed at all--the symptoms are cured with or without their psychical origin being discovered or even looked for. From at least one point of view this is wise—psycho-analysis often takes as many hours to effect a cure as Seale-Hayne influence takes minutes. Economically, the Seale-Hayne method is the only practicable one of the two where a great number of men must be dealt with.

The record of success is wonderful. But one also wonders what will happen in future to some of these men who have been discharged with a pension of 20 per cent. for a time. The question is suggested by meeting many cases of indisputably too low an estimate of disability in men some months after discharge from neurological hospitals (not remembered as Seale-Hayne certainly); cases where one's own maladroit suggestion, if any, was all conveyed in—"Well, what have you to say for yourself?" Would laying bare the psychical cause of the malady in the first instance have obviated a tendency to relapse or would it not? Or is it that the "atmosphere of cure" is not carried away to the man's home, and his independence droops for want of it?

And one would like to know what the men whose objective symptoms have been cured think of their own cases. Have they been cured of disabling subjective troubles—assuming they had them, as one is justified in doing? Subjective troubles are harder to cure than objective: on this point there is little said, and it is to be hoped notice will be given to this part of war neuroses in subsequent issues.

Much attention is paid to the objective "signs" of hysteria and their value in diagnosis. Pharyngeal anæsthesia is not a sign of hysteria, or rather it is suggested, just as hemi-anæsthesia is. Hysterical ptosis may be accompanied by over-action of the frontalis muscle. The abdominal reflexes may be absent in cases of anæsthesia, the reflexes appearing with return of sensibility. Babinski's "fan sign," fanning of the toes when eliciting the plantar reflex, may be present in hysterical paraplegia, and cannot, therefore, be considered as a sign of organic disease, as Babinski maintains, &c.

We have merely outlined the contents of these excellent publications, which are well illustrated; they should be read *in extenso*. The contents are briefly and incisively put, and will repay close examination.

Catalogue of Lewis's Medical and Scientific Circulating Library, including a Classified Index of Subjects, with the Names of those Authors who have Treated upon them. New Edition, revised to the end of 1917. London: H. K. Lewis & Co., Ltd. 1918. Demy 8vo. Pp. 492.

WITH spirited enterprise, Messrs. H. K. Lewis & Co., Ltd., the well-known publishers, of 136 Gower Street, London, W.C. 1, have brought out a second and much enlarged edition of the catalogue of their Medical and Scientific Circulating Library. The volume now runs to nearly 500 pages, and contains a vast number of works published by their own firm, and by many other publishers also.

The value of the volume, from a bibliographical standpoint, is very great, and it has been enhanced to no small extent by the addition of a classified index of subjects with the names of those authors who have treated upon them.

Guy's Hospital Reports. Edited by F. J. STEWARD, M.S., and HERBERT FRENCH, M.D. Vol. LXIX., being Volume LIV. of the third series. London: J. & A. Churchill. MDCCCCXVIII.

WE offer a cordial welcome to Volume LXIX. of Guy's Hospital Reports, which succeeds Volume LXVIII., after a war lapse of four years. It is perhaps a little less bulky, and less complete in its records than usual, but the causes for this are a credit to its contributors and editors, and the Medical Reports which it contains are full of clinical interest. Its earlier pages are devoted to sympathetic records of the now-ended life history of three well-known Guy's men—Sir Henry Howse, Peter Horrocks, and Arthur Brailey. Nine other articles complete its pages, each one of which is well worthy of perusal. Sir Frederick Taylor, in a reprinted article on "Some Acute Abdominal Pains which do not require Operation," reminds us of the acute gastric symptoms which may precede the development

of diabetic coma, and also of the pains which sometimes follow the injection of foreign serums. Rowlands writes on partial gastrectomy for carcinoma of the stomach, and Stephens on the Wassermann reaction in amentia; while McGrath contributes an exceedingly interesting article on "The Experimental Production of Tuberculosis in Guinea-Pigs previously exposed to X-rays," and incidentally discusses the laboratory diagnosis of tuberculosis in general. Three interesting clinical cases are described—namely, a case of peri-arteriitis nodosa, one of adenoma of the choroid plexus, and some examples of amœbic dysentery in British residents. Pathology also is not neglected, as witnessed by an elaborate report of mesodermal mixed tumours of the uterus; while, lastly, Pembrey, as a result of a physiological research, reports strongly to the advantage of the use of warm ether as an anæsthetic, as compared with the use of open ether in a well warmed room.

The War Work of the Y. M. C. A. in Egypt. By SIR JAMES W. BARRETT, K.B.E., C.B., C.M.G., F.R.C.S. (Eng.); with a Preface by SIR E. H. ALLENBY. 23 Plates and 3 Maps. London: H. K. Lewis & Co. Demy 8vo. Pp. xx + 212.

THIS book will be read with interest by all those who were associated with our campaigns in Egypt, Palestine and Gallipoli, and also by many of the general public. The author admits that, prior to the war, he was himself in practically entire ignorance of the work of the Y. M. C. A. His own enlightenment regarding the work that its organisation is capable of carrying out seems to have been the primary factor that has led him to indite this record, with the object in turn of enlightening others. His admiration for the work done is profound, and is in itself a testimony of which the Association may well be proud. He begins by giving a short sketch of the origin and development of the Y. M. C. A. movement both in England and in America, and then describes in detail how, in alliance with the Red

Cross organisation, steps were taken to deal with the urgent needs of the troops who poured into Egypt in 1915. Successive chapters deal with the arrangements made in Cairo, Alexandria, and elsewhere in Egypt, and also in Mudros, on the peninsula itself, in the Fayûm, and in Palestine. The record is one of unselfish and invaluable work, often carried out in the face of difficulties, financial and otherwise, and of danger. Not only directly, but also indirectly, by saving many from the dangerous amusements of Eastern towns, the Y. M. C. A. has shown itself an important factor in maintaining the moral and physical health of our race.

Surgical Treatment. A Practical Treatise on the Therapy of Surgical Diseases for the use of Practitioners and Students of Surgery. By James Peter Warbasse, M.D.; Fellow of the American College of Surgeons, American Medical Association, American Academy of Medicine, New York Academy of Medicine; formerly Attending Surgeon to the Methodist Hospital, Brooklyn, New York. In three volumes, with 2,400 Illustrations. Volume I. Pp. 947. W. B. Saunders Company. 1918.

We notice in the opening sentence of this author's preface that this work has been written in the interest of the surgical patient, the object being to place in the hands of the surgeon the means for rendering help in every surgical condition under all circumstances. The aim has been to make this information easily accessible and its application practicable. The volume before us is devoted to general principles of Surgical Treatment; anæsthesia and anæsthetics, wounds and operations, inflammations, tumours, blood and blood-vessels, lymphatics, bones, joints, muscles, tendons and fasciæ, skin and nerves.

From our perusal of this bulky volume we are satisfied that the author has so far accomplished what in the preface he undertook to do.

The illustrations are abundant and well-selected. If

the succeeding volumes come up to the standard of this first volume we can safely say that the profession will be under a deep debt of gratitude to the author for the labour he took upon himself. The standard of excellence is very high indeed, and the teaching thoroughly sound. Every surgeon should be the possessor of this work and we predict for it a great success.

Irish Ethno-Botany and the Evolution of Medicine in Ireland. By MICHAEL F. MOLONEY, M.B. Dublin: M. H. Gill & Son, Ltd. 1919. Pp. 96.

THE first part of this booklet is interesting in spite of its mongrel name. It contains a list of the plants that enter into the native vegetable Materia Medica, Latin, English and Irish names, and in many cases the reputed therapeutic actions being given. Some of the more interesting of the latter deal rather with magic and protection from the evil influences of fairies than with Medicine.

Some of the "Simples" may be worth trying. Milk with a sprig or two of groundsel boiled in it is strained and given to constipated babies. A handful of Herb Robert is infused in a pint of water and a wineglassful is given night and morning in diabetes. St. John's Wort dispels the clouds of melancholy and other forms of insanity.

There are three good indexes—Irish, English and Scientific—but it is a pity that the source and date of the Irish names are not given.

Part II., which deals with the History of Medicine in Ireland, is sketchy and not convincing. In the preface we read: "Our country's share in the development of Medcine is unknown, and therefore, unrecognised. The names of Graves, Stokes and Corrigan are undoubtedly impressed on the Annals of Medicine, yet these men do not represent the Irish so much as the Anglo-Celtic School."

The present work does not lift the veil!

MILITARY MEDICAL MANUALS.

General Editors: Sir Alfred Keogh, G.C.B., M.D., F.R.C.P.; Lt.-Gen. T. H. J. C. Goodwin, C.B., M.G., D.S.O

1. *Wounds of the Pleura and of the Lung.* By R. Gregoire, Professor of the Faculty of Medicine, Paris, and Surgeon to the Hospitals; and A. Courcoux, Physician to the Hospitals of Paris. Translated and edited by G. H. Fagge, F.R.C.S., Surgeon to Guy's Hospital. London: University of London Press, Ltd; Paris: Masson et Cie. 1919. Cr. 8vo. Pp. xxiii + 222.
2. *Nerve Injuries and their Treatment.* By Sir James Purves Stewart, K.C.M.G., C.B., M.D. (Edin.), F.R.C.P.; and Arthur Evans, M.S., M.D. (Lond.), F.R.C.S. Second Edition, revised and enlarged. London: Henry Frowde and Hodder & Stoughton, Oxford University Press. 1919. Demy 8vo. Pp. vii + 249.

1. A very carefully written account of the macroscopic pathology, complications, sequelæ, and treatment of chest wounds. The weakest part of the work is the lack of systematic bacteriological observation.

There are four people essential to form a "team" for the proper treatment of chest wounds. In order of importance they are: the physician, the bacteriologist, the *x-ray* specialist, the surgeon. Without the bacteriologist, there is no way of finding out whether a chest fluid is virulently infected, and the result is what the authors insist on in this book—viz., that pleural effusions must be seen to be purulent with the naked eye before they are to be drained. Apart from this failing, the standard of excellence in the volume is very high.

2. For a straightforward and simple description of the many varieties of nerve injuries the reader need look no further than this book. The standard of surgery maintained is very high. The methods of examination are

simple and sound. The grounds for operating are clearly defined, and the procedure is laid down on rational lines.

The volume is well turned out, well printed, and well edited. The authors are to be congratulated on the result of their close observations on difficult work. H. S.

The Soldier's First Aid. By R. C. Wood, Q.-M.S. A.M.C. Toronto: The Macmillan Company of Canada, Ltd. 1918. Pp. 93.

Out of a vast number of "First Aid" hand-books which have appeared during the past few years this stands out owing to the simple way in which it is written and the practical nature of its directions. Scientific terms and theoretical considerations are avoided, but treatment and improvisation are clear and easily followed.

Treatment of injuries, methods of carrying, collecting men under fire, improvisation of stretchers, &c., are illustrated by excellent photographs. The author's portrait is presented as a frontispiece.

The Whole Duty of the Regimental Medical Officer. By P. Wood, Temp. Capt., R.A.M.C. London: Forster, Groom & Co., Ltd. 1919. Pp. 78.

A pleasantly written book, full of hints well worth the attention of an M.O. taking charge of an isolated unit for the first time. It will help him to avoid many pitfalls waiting for the feet of the unwary and unwarned. The book is divided into four sections—Duty to the State, Duty to the Unit, Duty to Self, Camp-inspection—and subdivided into numbered paragraphs. The index is really a table of contents at the end. However, in such a short book it enables required points to be looked up which is the thing that matters.

Anatomy, Descriptive and Applied. By HENRY GRAY, F.R.S., F.R.C.S. Twentieth Edition. Edited by ROBERT HOWDEN, M.A., Sc.D., M.B., C.M.; Professor of Anatomy, University of Durham. London: Longmans, Green & Co. 1918.

THE twentieth edition of Gray's Anatomy will maintain and enhance the splendid reputation which this work has achieved, and Professor Howden is to be congratulated upon the success of the book of which he has been sole editor for the last ten years. In his able hands each new edition has become more and more attractive, and Gray's Anatomy has been kept up-to-date without the addition of unimportant details. The twentieth edition contains a short account of the life of the original author, and also a portrait, both of which add to the interest of the volume, especially in the case of those who have had a long acquaintance with numerous earlier editions. The nomenclature has been simplified by the omission of many old and rarely used synonyms, and numerous additional and excellent illustrations have been inserted in the text.

Surgery in War. By ALFRED J. HULL, F.R.C.S; Lieut-Col., R.A.M.C.; Surgeon, B.E.F., France; late Lecturer on Surgical Pathology, R.A.M. College, Millbank, and Surgeon, Queen Alexandra Military Hospital. With a Preface by Lieut.-Gen. SIR T. H. J. C. GOODWIN, K.C.B., C.M.G., D.S.O.; Director General A.M.S. Second Edition, with 210 Illustrations. London: J. & A. Churchill. 1918. Pp. xv. & 624.

IT is unnecessary for us to do more than draw the attention of the profession to the fact that a new edition of this book has been published, and that the latest advances in surgical technique and experience have all been incorporated in this revised edition. It is a most valuable and reliable record of the work done at the front.

We heartily congratulate the author upon his production of a thoroughly sound volume. The illustrations are all that could be desired.

PART III.
MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

ADVANCES IN THE TREATMENT OF CHOLERA.

We extract from the *Madras Mail*, Wednesday, January 15, 1919, the following summary of an Address delivered at the Opening Session of the Science Congress, held at Bombay on January 14, 1919, by the President, Sir Leonard Rogers:—

Early Researches on Cholera.—The treatment of cholera at the beginning of the twentieth century remained much as it was seventy years before, when Latta and Mackintosh, in Edinburgh, in 1831, introduced the plan of injecting large quantities of normal saline solution into the veins to combat the collapse stage of cholera. This brilliant idea just failed to be a great discovery because no means was then found of retaining the fluid in the circulation, so that the apparently miraculous immediate effect of reviving the patient as one from the dead was usually followed by fatal recurrence of the terrible drain of fluid from the system. At the time I commenced my investigations the method was seldom used, as shown by the fact that a search through the records of the Calcutta European General Hospital from 1895 to 1904 showed no case in which large saline intravenous injections were given, while the mortality among 95 cases in those nine years reached the appalling figure of 87.4 per cent. Indeed, it was generally recognised that once an European patient reached the collapse stage in cholera recovery scarcely ever took place.

Treatment of Cholera.—As the first whole-time Professor of Pathology in Bengal, the home of cholera, who stuck to unlucrative research work for any length of time, this fell disease naturally attracted my attention, but it was not until after the completion of the first edition of my work on "Fevers in the Tropics," the collection of material for which

occupied me for twelve years, that I was able to take up serious work on cholera in 1908. I had previously made a number of blood counts, and, with the help of my friend, Major Megaw, I.M.S., had studied, in 1906, Latta and Mackintosh's plan of injecting large amounts of normal or isotonic salt solution—that is, one containing the same proportion of salts as the normal blood, controlling the quantities injected by special blood, and blood-pressure examinations, in the hope that with the aid of these modern methods better results would be obtained. This hope was largely disappointed, as the mortality fell only from 59.0 per cent. during the previous eleven years, to 51.9 per cent. in 1906, and the method, which is a time-consuming one, was once more abandoned as of little service.

On thinking the matter over while on furlough, it occurred to me that on the physiological principle that a high salt content tended to retain fluid in the blood, it would be worth while to try a stronger salt solution, and on return from leave with renewed energy at the end of 1907, I determined to put this theory to the test. I may perhaps be pardoned for digressing for a moment to remark that shortly after my last three periods of furlough I discovered respectively the development of the flagellate stage of the Leishman-Donovan body, furnishing an important clue to the probable mode of infection of kala azar, the hypertonic saline treatment of cholera, and the emetine treatment of dysentery—an experience which I trust will encourage Indian Administrations to give liberal and frequent leave to research workers to enable them to keep as fit and fresh as possible for their important and exacting labours. Up to this time the strength of salines generally advised in cholera was 0.6 per cent., although recent physiological text-books have raised the figure for normal saline to 0.85 per cent. As I wished to give a hypertonic solution—that is, one containing more salt than the normal blood—I doubled the former strength, and used a 1.2 per cent. of sodium chloride, or 120 grains to a pint, to which I afterwards added 4 grains of calcium chloride, because physiologists have found the latter salt to be beneficial to the heart. Captain (now Lieutenant-Colonel) Mackelvie, I.M.S., very kindly carried out the hypertonic injections in the cases under his care, while I made a series of observations on the blood,

to be related presently. Cholera, plague, and septic cases were in those days treated in a dark basement of the Medical College Hospital, requiring artificial light in the daytime, but the results were soon evident in the cheering sight of a number of convalescent cholera patients for the first time within the memory of a faithful old nurse, who laboured for ten years in these dismal surroundings. They may be summarised in a sentence, by saying that by using two teaspoonfuls of common salt to a pint of water instead of one, the mortality of cholera was nearly halved. Nothing could well be simpler, yet nearly eighty years had elapsed since salines were first injected intravenously in cholera before the physiological principle of using a hypertonic instead of an isotonic solution was established. It was at once clear to me that a great advance had been made, which stimulated me to persevere with my investigations of the blood changes in cholera, so as to place the whole subject on a firm scientific basis.

Permanganates and other Drugs.—The success of the hypertonic saline injections in enabling the collapse stage of cholera to be largely overcome opened the way to a trial of drug treatment such as had never before been possible; for it is clear that unless the circulation can be restored and maintained, drugs given by the mouth will not even be absorbed, and can have no chance of exerting their beneficial action. Great care is required to make such tests reliable on account of the numerous sources of fallacy in estimating the effects of a given treatment. For example, I found from an examination of the Calcutta Medical College Records of the eleven years before I commenced my new treatment that the case mortality was 66.7 per cent. in the first quarter of the year, but steadily declined to only 46.7 per cent. of the third quarter. Again, in a Karachi epidemic, the death-rate in the first one hundred cases was 79 per cent., and in the last one hundred only 40 per cent., or one-half the first figure. Unless this is borne in mind a drug tried in the latter part of an outbreak may be given credit for what is only the natural decrease in the severity of the disease. For this reason, I only compare whole year records or similar season's cases, or, better still, use a new drug in every other case in addition

to the routine treatment, the remaining half of the cases then serving as a control. When two simultaneous series, one with and the other without the new remedy, have been carefully recorded—for which purpose I use specially printed forms, the regular filling in of all the headings and columns of which ensures completeness of the notes in every particular—the two series can be compared as regards all points which previous studies have shown to be the causes of the high mortality. To take an example of this method of investigation, the late Sir Lauder Brunton, some years ago, advocated on physiological grounds the use of atropine in cholera, but was able to try it only in two mild cases, with inconclusive results. I, therefore, gave the drug hypodermically in addition to the routine treatment in every other case of cholera in my wards for a whole year, with the result that the mortality was much lower in the atropine series, while a careful comparison of the two sets of cases as regards their severity showed them to be strictly comparable. I have, therefore, added atropine to my system of treatment, with, I am sure, beneficial results. In a similar manner emetine was found to be useless in cholera.

Another point I wish to emphasise is the importance of carefully studying one's failures rather than being elated with any success, as the further progress I have still to relate is mainly due to my adopting that practice. For the last ten years I have tabulated—with the aid of shorthand, of the value of which to my work I cannot speak too highly—all the more important points of my cholera cases, now amounting to just over 2,000, and have closely studied the records of all fatal ones to ascertain the reasons for the failures, with a view to finding means of lessening them. The following examples will illustrate some of the results thus obtained:—

After an experience of a year and a half of the hypertonic treatment, I realised that something more was required if the mortality was to be still further reduced. The failures appeared to me to be largely due to a recurrence of the collapse on account of absorption of the toxins produced by the cholera bacillus in the intestinal canal with the restoration of the circulation after the saline injections. Now the toxins are contained in the bodies of the innumerable bacilli, and are

set free when they break up, as they do in enormous numbers, for it has been shown that no less than 99 per cent. of comma bacilli die in culture tubes within forty-eight hours. The use of intestinal antiseptics may very possibly add to the toxin absorption by killing the bacilli, which is, I believe, one of the reasons for their failure, as already stated. I, therefore, sought for some method of destroying the toxins themselves while still unabsorbed in the bowl, and, bearing in mind that they are largely albumoses and other unstable albuminous products of the metabolism of the organisms, and that such substances are readily destroyed or rendered inert by oxidisation, I experimented with various oxidising agents, and particularly with permanganates, which are well known to rapidly destroy in vitro the albumoses of snake venoms: a point at which I had previously worked. I was thus able to demonstrate that several times a lethal dose of dead comma bacilli containing the toxins could be neutralised by a small quantity of permanganates. A trial of large doses of permanganate of patassium in pill form by the mouth, as much as one hundred grains sometimes being given in the course of several days, in addition to the hypertonic treatment, reduced the mortality of cholera during a year's use from 32.6 to 23.3 per cent., and it has now been used for over nine years in my wards with increasingly favourable results. Permanganate pills have also been used in cholera epidemics in both the Bombay Presidency and the Central Provinces, in villages under conditions in which the saline treatment was not practicable, and favourable results have been reported, although, of course, it cannot by itself save the most severe cases with extreme collapse.

Alkalies and Renal Complications.—There still remained one very important line of investigation, which has recently led to a further substantial reduction of the death-rate of cholera by enabling the common and most deadly suppression of the renal functions to be largely averted. I know of nothing more disheartening than after successfully maintaining the circulation by hypertonic salines through a life and death struggle for several days and nights to be unable to get the kidneys to resume their functions, with ultimate

loss of the patient. Before the hypertonic treatment many of the few patients who recovered from collapse eventually died of renal failure, and a careful study convinced me that the losses from this cause were reduced to some extent by the saline injections in spite of so many severe cases being tided over the collapse stage to face the dangers of suppression of urine. Further diurnal estimations of the blood-pressure and the specific gravity of the blood afforded valuable indications for further saline injections to aid the renal secretion. Nevertheless, as the losses from collapse were steadily reduced by the various measures I have related, the death-rate from kidney failure continued much the same, and now became the most important remaining cause of loss of life, and it became clear that some factor remained which was not clearly understood.

Light was first thrown on this problem by an American physician, Dr. Sellards, working in the Philippines, who suspected a diminution in the alkalinity of the blood, or acidosis, as it is generally termed, because he found that large doses of alkalies by the mouth failed to make the urine alkaline, as it would do in health. He, therefore, added sodium bicarbonate to the saline solution used in cholera for intravenous injections, and obtained marked reduction in the death-rate from renal failure. In 1911 Major Megaw, when acting for me in Calcutta, read Sellards' work, and tried alkaline solutions intravenously in cases of cholera with suppression of urine, but with disappointing results, the measure being apparently too late, once this complication had become established. Early in 1912 I, therefore, commenced an investigation of the changes of the alkalinity of the blood in cholera, which Sellards had not then done. It became clear that in all severe cholera cases sodium bicarbonate should be added to the hypertonic saline solution as a routine measure to combat the acidosis from the first, and prevent it reaching a dangerous degree. The results of this addition to the treatment was soon apparent, and after three years' use of the alkaline solutions the death-rate from renal complication among nearly six hundred cases had fallen to 2.98 per cent. from a figure of 11.1 per cent. during the previous three years, or a reduction of 74 per cent. in the losses from this deadly

complication, and the last remaining cause of death in cholera was thus largely conquered. Captain Southern has recently shown that in addition to acidosis there is also a retention of phosphates in cholera, which can be reduced by the administration of calcium salts in the form of lime water; but I have not yet been able to adequately test this hypothesis. From this point of view calcium permanganate may be preferable to the potassium salt, but in earlier work I found the calcium salt to be less convenient on account of its extremely hygroscopic nature, but it is worthy of further consideration.

Diminution in Mortality.—I fear I shall have wearied you with this long account of my researches on cholera, but the results may be very briefly summarised in the following statement showing the mortality under the different forms of treatment, or rather under the continued elaboration of my system of treatment with increasing knowledge derived from combined clinical and pathological investigations extending over twelve years. All culminated in a reduction of the mortality between 1895 and 1905, before I began work, of 59.0 per cent. to one of 19.1 per cent. between 1915 and 1917, or one-third of the former rate, while in 1917, among 208 cases, it was but 14.9 per cent. or one-fourth of the earlier figure—and this, although all cases admitted moribund and dying before a saline injection could be given, those coming in late in a hopeless state from suppression of urine, and very young and very old persons without the stamina to allow the treatment to have a fair chance, are included.

Future of Indian Research.—The great lesson to be derived from the researches on cholera which I have related is the importance of combined clinical and pathological investigations. So strongly do I hold the necessity of medical research workers being in the closest possible relationship with large hospitals to enable them to work on practical lines that I regard Pasteur's great discovery of his preventive treatment of hydrophobia as having been a curse rather than a blessing to India, because it has led to three important research laboratories being placed on remote hilltops for the sake of the relatively insignificant mortality from hydrophobia to the grave detriment of work on all the more important tropical diseases. Now that the treatment of hydrophobia and other

bacteriological methods can be carried out in the plains with the help of a refrigerator (and where necessary a temperate room), as is being done at the present time in Rangoon, no excuse for further repetitions of this grave mistake remain. Unfortunately, Assam rejected the opportunity of which Rangoon took advantage, and now that the terrible kala-azar is again ravaging the Sibsagar district, cases have to be imported into Shillong to enable the one research worker of the Province, who is tied to the Pasteur Institute for want of an assistant qualified to carry out the routine hydrophobia treatment, to have some slight opportunity of tackling the greatest problem of Assam and other large areas of India.

The serious disadvantage which so many of the members of the bacteriological—or as it should be called, medical research—department now labour under by their divorce from large hospitals in the plains will be partly removed when the schools of tropical medicine in Calcutta and Bombay are opened, when team work, so essential to the solution of the larger medical problems, will be possible. In addition, all the larger hospitals should have whole-time pathologists, both to enable the abundant clinical material they contain to be made available for research purposes, and also to allow the clinical staff and the patients to have the immense advantages in the diagnosis and in the vaccine and other lines of treatment which a bacteriological laboratory affords through recent advances in our knowledge of Medicine. Until recently the professors of pathology in our medical colleges have been also physicians, and natu rallyspent most of their time in clinical work and general practice, and with rare exceptions—such as McConnell, of Calcutta—added but little to our knowledge of the pathology of tropical diseases. It was only in 1899 that the first whole-time pathologist was sanctioned for the Calcutta Medical College, and fortunately for me, the previous incumbent soon gave it up for the more attractive and lucrative clinical line. During the last nineteen years I have had unrivalled opportunities for combined clinical and pathological research.

The access of pathologists to the clinical material nécessary for their researches may sometimes be a difficult problem, although, as a rule, clinicians are quite willing to give the necessary facilities. Personally, I am

especially indebted to a long series of superintendents and resident surgeons of the Calcutta European General Hospital for opportunities, without which the material for my book on " Fevers in the Tropics " could never have been accumulated. For some researches, however, more complete control of clinical cases is required, and this urgent need led me, with the invaluable help of Sir Kailash C. Bose, to collect the money required to build the Carmichael Hospital for Tropical Diseases as an integral part of the Calcutta School of Tropical Medicine. This will allow of the cases of any special disease under investigation to be placed at the disposal of a particular research worker to the necessary degree without his being burdened with the charge of clinical material of all kinds, as in former days, to the detriment of his research work. In future, I understand, pathologists of our medical colleges will be supplied from the bacteriological or research department, and will make the subject their life study, and not be eligible for clinical posts. In order to get the medical officers with the highest abilities and scientific training required for success in research to devote their lives to it, and to abandon the much more lucrative clinical side of medicine, it will be absolutely necessary to give them salaries in proportion to the long and expensive scientific training of from six to eight years which they receive after finishing their general school education.

Need for Liberal Endowments.—Lastly, I wish to draw attention to the great life-saving and economic importance of such investigations as those which I have related on cholera, and many others which might be mentioned; as, when this is fully realised by the public, endowments of medical research will surely be forthcoming in India on a far larger scale than hitherto. Bengal and Behar have generously given me Rs. 7 lakhs for the Calcutta School of Tropical Medicine, half of which has been expended on the Carmichael Hospital for Tropical Diseases, and the remainder will be used for medical research and the partial upkeep of the hospital under a governing body of medical experts. In addition, the Tea Jute and Mining Associations are contributing Rs. 60,000 a year for the support of three additional workers to investigate on practical lines those diseases which affect

the value of the labour forces. Bombay has always been noted for the liberality of her citizens, so I confidently appeal to this great city to do at least as much for my friend Colonel Liston's school here, which he has laboured so long and patiently to found in connection with the Parel Laboratory.

But I also desire to make a still wider appeal. Now that the world-wide devastation and the destruction of irreplaceable human life has at length ceased, I should like to see the flow of money diverted to the noble object of saving life by means of a great extension of medical research, and I can conceive of no more fitting thankoffering of the delivery of the world from the greatest menace that has ever threatened modern civilisation. What is wanted is an Indian Rockefeller to come forward with a score or two of rupees, backed by large contributions from many others, to be devoted to the aid of genuine medical research all over India, independently of race or position, under the control of a governing body, the chairman and a large majority of whom should be scientific experts. I feel confident that practical philanthropy of this nature, by diminishing suffering and disease, and giving better health to the masses, will be of more real benefit to India than any so-called boons which have ever been dreamt of. Legacies for such work will, no doubt, be welcomed by the Indian Research Association at Simla, but those who give liberally during their lifetime will have the far greater satisfaction of seeing for themselves the seed they sow in faith bearing fruit abundantly. As example is better than precept, I may mention that I am giving as much as the most liberal donors to the Calcutta School of Tropical Medicine, and hope to be able to do still more for medical research in the near future, so I am not asking others to do anything I am not willing to do myself to the limits of my power. In addition to the rich princes and noblemen, who ultimately derive their wealth from the agricultural labourer, I especially appeal to those who have made their fortunes in commercial enterprises to do all they can to help in this practical way the labour forces, to whom they so largely owe their prosperity. So it is to the large commercial towns that we must also look for the help we require to bring the blessings of medical research to the aid of the hundreds of millions of patient toilers of India.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, May 17, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective district—registered in the week ended Saturday, May 17, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 16.8 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, May 17, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 16.8 and 17.5; Dublin Registration Area, 17.9 and 18.3; Dublin City, 18.3 and 18.7; Belfast 15.1 and 15.4; Cork, 15.6 and 16.0; Londonderry, 21.6 and 22.2; Limerick, 21.7 and 23.0; and Waterford, 15.2 and 16.6.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, May 17, 1919, were equal to an annual rate of 0.4 per 1,000. Among the 116 deaths from all causes in Belfast were 1 from diarrhœa and enteritis in a child under 2 years of age, and 1 from cerebro-spinal fever.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended May 17, 1919, amounted to 182—90 boys, and 92 girls, and the deaths to 149—73 males and 76 females

DEATHS.

The deaths registered, omitting the deaths (numbering 10) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 17.9 per 1,000 of the population. The rate for all deaths registered during the twenty weeks of 1919 ended May 17, was 32.8, while in the corresponding period of the preceding ten years, 1909–1918, it had been 25.3.

The 139 deaths appertaining to the Area included 1 from measles, 1 from diphtheria, 4 from diarrhœa and enteritis of children under 2 years. There were 7 deaths from influenza. In the three preceding weeks deaths from this cause in the Registration Area had numbered 7, 10 and 11, respectively,

Deaths attributed to pneumonia were 15 in number (comprising 6 from broncho-pneumonia, 2 from lobar pneumonia and 7 from pneumonia, type not distinguished).

Tuberculosis caused 17 deaths as against 18, 28, and 24, respectively, in the three weeks preceding. Of the 17 deaths ascribed to tuberculosis, 9 were referred to pulmonary tuberculosis, 4 to tubercular meningitis, and 4 to other forms of tuberculosis.

Five deaths were caused by cancer, 12 by organic diseases of the heart, and 19 by bronchitis.

Among the deaths of infants under one year old, 5 were due to convulsions, 4 to diarrhœa and enteritis, 1 to congenital mal formation, 5 to premature birth, and 1 to congenital debility.

Twenty-nine of the deaths registered during the week appertaining to the Area were of children under 5 years of age 22 being of infants under one year, of whom 11 were under one month old. Forty-four (44) deaths of persons aged 65 and upwards were registered, including 31 deaths of persons of 70 years or upwards

Of the 139 recorded deaths 48 occurred in hospitals and other public institutions.

One death was caused by drowning.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended May 17, 1919, and the cases under treatment at its close,

respectively, were as follow :—Enteric fever, 1 and 4 ; typhus, 1 and 1 ; measles, 26 and 28 ; scarlet fever, 10 and 33 (exclusive of 11 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork StreetHospital); and diphtheria, 2 and 6. Thirteen cases of pneumonia were admitted during the week, and 27 remained under treatment at its close. Of the deaths in hospital recorded during the week, 4 were from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, May 17, 1919, in 96 large English towns (including London, in which the rate was 11.3) was equal to an average annual death-rate of 12.0 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 13.5 per 1,000, the rate for Glasgow being 14.4, and that for Edinburgh 17.2.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ *N., Long.* 6° 15′ *W., for the Month of May*, 1919.

Mean Height of Barometer - - -	30.010 inches
Maximal Height of Barometer (26th, at 9 p.m.),	30.313 ,,
Minimal Height of Barometer (1st, at 9 p.m.)	29.471 ,,
Mean Dry-bulb Temperature - - -	54.2°.
Mean Wet-bulb Temperature - - -	50.8°.
Mean Dew-point Temperature - -	47.7°.
Mean Elastic Force (Tension) of Aqueous Vapour	0.330 inch.
Mean Humidity - - - -	78.6 per cent.
Highest Temperature in Shade (on 14th) -	70.2°.
Lowest Temperature in Shade (on 8th) -	40.8°.
Lowest Temperature on Grass (Radiation) (8th)	35.0°.
Mean Amount of Cloud - - -	52.1 per cent.
Rainfall (on 13 days) - - - -	1.650 inches.
Greatest Daily Rainfall (on 14th) - -	0.484 inch.
General Directions of Wind - - -	E., S.E.

Remarks.

A favourable month after an unsettled opening. The mean atmospheric pressure (30.010 inches, or 1016.2 millibars) was exactly equal to that of April ; but the prevalent winds were

easterly instead of westerly as in April. The mean temperature was 3.2° above the average for the thirty-five years, 1881–1915, so that the month may be classed as warm. A thunderstorm on the night of the 14th followed a very summerlike day, and was succeeded by unusual visibility lasting over 2 days. In a quiet, calm, dry anticyclonic period after the 24th the atmosphere became more and more hazy. It is noteworthy that about five-sixths of the rainfall of the month took place in the night hours—between 9 p.m. and 9 a.m. Only 0.257 inch fell in the twelve day hours from 9 a.m. to 9 p.m. After a heavy dash in the early morning hours of the 25th, the weather remained rainless to the close of the month.

In Dublin the arithmetical mean temperature (55.8°) was 3.2° above the average (52.6°). The mean dry-bulb readings at 9 a.m. and 9 p.m. were 54.2°. In the fifty years ending with 1915, May was coldest in 1869 (M. T. = 48.2°), and warmest in 1893 (M. T. = 56.7°). In 1916 the M. T. was 52.1°, in 1917, 53.9°, and in 1918, 54.9°.

The mean height of the barometer was 30.010 inches, or 0.021 inch above the corrected average value for May—namely, 29.989 inches. The mercury rose to 30.313 inches at 9 p.m. of the 26th, having fallen to 29.471 inches at 9 p.m. of the 1st. The observed range of atmospheric pressure was therefore, 0.842 inch.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 54.2°, or 7.9° above the value for April, 1919—46.3°. Using the formula *Mean Temp.* = *Min.* + (*Max.* – *Min.*) × .47, the value is 55.4°, or 3.2° above the average mean temperature for May, calculated in the same way, in the thirty-five years, 1881–1915, inclusive (52.2°). The arithmetical mean of the maximal and minimal readings was 55.8°, compared with a thirty-five years' average of 52.6°. On the 14th the thermometer in the screen rose to 70.2°—wind, S.E. On the 8th, it fell to 40.8°—wind, N.E. The minimum on the grass was 35.0° on the 8th.

The rainfall amounted to 1.650 inches, distributed over 13 days. The average rainfall for May in the thirty-five years, 1881–1915, inclusive, was 2.050 inches, and the average number of rain-days was 15. The rainfall, therefore, and

also the rain-days were below the average. In 1886 the rainfall in May was very large—5.472 inches on 21 days; in 1869, also, 5.414 inches fell on 19 days. On the other hand, in 1895 only 0.177 inch was measured on but 3 days. In 1896 the fall was only 0.190 inch on 7 days. In 1916, as much as 4.634 inches fell on 21 days. In 1917, 2.980 inches fell on 12 days, and in 1918, 2.273 inches on 10 days.

Fresh winds were noted on 7 days, attaining gale force on the 1st. There was a fog on the 19th. Thunder and lightning occurred on the night of the 14th. There was unusual visibility on the 15th and 16th. A solar halo was seen on the 22nd. Hail fell on the 2nd.

The mean minimal temperature on the grass was 45.0°. The lowest daily maximum was 52.9° on the 7th. The highest daily minimum was 58.8° on the 31st. The mean maximum was 62.2°, the mean minimum was 49.3°.

The rainfall in Dublin during the five months ended May 31st amounted to 8.777 inches on 91 days, compared with 8.676 inches on 70 days in 1918, 9.862 inches on 77 days in 1917, 14.648 inches on 105 days in 1916, 9.490 inches on 82 days in 1915, 8.132 inches on 85 days in 1914, 13.899 inches on 91 days in 1913, 11.161 inches on 87 days in 1912, 5.986 inches on 69 days in 1911, only 5.971 inches on 70 days in 1896, and a thirty-five years' average of 10.070 inches on 82 days.

At the Normal Climatological Station in Trinity College, Dublin, the observer, Mr. A. W. Boyce, returns the mean height of the barometer as 30.010 inches. The highest reading observed was 30.310 inches at 9 a.m. of the 24th and 9 p.m. of the 26th, the lowest was 29.454 inches at 9 p.m. of the 1st. The arithmetical mean temperature was 54.7°, the mean dry-bulb reading at 9 a.m. and 9 p.m. being 54.6°. Rain fell on 12 days to the amount of 1.55 inches, 0.43 inch being measured on the 14th. The number of hours of bright sunshine registered by the Campbell-Stokes sunshine recorder was 172.5, giving a daily average of 5.6 hours. The greatest daily amount of sunshine was 12.6 hours on the 27th. The mean earth temperature at 9 a.m. was 54.0° at a depth of one

foot below the surface, 50.1° at 4 feet. The highest temperature in the shade was 70° on the 27th; the lowest was 38° on the 8th.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, Dundrum Castle, Co. Dublin; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Mrs. Sydney O'Sullivan, Auburn, Greystones; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 1.51 inches on 12 days. Average, 2.15 inches on 14 days. Maximum in 24 hours, 0.43 inch on 1st. Rainfall since January 1, 9.48 inches on 94 days. Average, 10.48 inches on 80 days. Max. temperature in shade, 66.9° on 30th; min., 38.9° on 7th.

Malahide.—Rainfall, 1.245 inches, on 8 days. Maximum 0.31 inch on 24th.

Clonee.—Rainfall, 1.95 inches on 11 days. Maximum, 0.36 inch on 24th. Total since January 1st, 12.36 inches on 95 days.

Phœnix Park.—Rainfall, 1.830 inches, on 12 days, Maximum, 0.344 inch on 1st and 18th. Bright sunshine. 191.9 hours, including 13.4 hours on 27th.

Cheeverstown.—Rainfall, 1.35 inches, on 12 days. Maximum, 0.39 inch on 1st.

Donnybrook.—Rainfall, 1.590 inches, on 12 days. Maximum, 0.385 inch on 14th.

Ranelagh.—

Mean corrected Height of Barometer, - - 30.008 inches.

Highest corrected Reading (24th, 9 hours), -	30.31 inches.
Lowest corrected Reading (1st, 21 hours), -	29.47 inches.
Mean Dry-bulb Temperature, - - -	53.8°.
Mean Wet-bulb Temperature, - - -	51.2°.
Mean Vapour Pressure, - -	0.345 inch.
Mean Humidity, - - - -	83 per cent.
Mean Maximal Temperature, - - -	62.0°.
Mean Minimal Temperature, - - -	46.5°.
Arithmetical Mean Temperature, - -	54.3°.
Highest Temperature in Screen (27th), -	71.0°.
Lowest Temperature in Screen (8th), - -	34.0°.
Lowest Temperature on Grass (7th), - -	26.0°.
Nights of Ground Frost, - - -	4
Rainfall (on 13 days), - - - -	1.62 inches.
Greatest Daily Rainfall (14th), - -	0.56 inch.
Mean Amount of Cloud, - - -	56.7 per cent.
Days of Clear Sky : - - -	6.
Days of Overcast Sky, - - -	10.
General Directions of Wind, - - -	S.E. to N.E.

Remarks.—A warm favourable month.

Dundrum.—Rainfall, 2.09 inches on 19 days. Maximum, 0.62 inch on 14th. Mean shade temperature, 54.9° ; highest, 73° on the 27th ; lowest, 39° on the 8th. Thunder and lightning on 14th.

Killiney.—Rainfall, 1.52 inches on 10 days. Maximum, 0.49 inch on 14th. Average (24 years) 1.870 inches on 15 days.

Greystones (Rathdown House).—Rainfall, 2.35 inches on 14 days. Maximum, 0.83 inch on 20th. Thunderstorm on 14th.

Greystones (Auburn).—[No Return].

Newcastle.—Rainfall, 1.85 inches on 12 days. Maximum, 0.82 inch on 20th. Mean temperature, 53.0° ; maximum, 68°; on 30th ; minimum, 38° on 6th ; mean maximum, 59.9° ; mean minimum, 46.1°.

Ennistymon.—Rainfall, 3.32 inches on 17 days. Maximum, 0.88 inch on 14th.

Castleconnell—Rainfall, 3.34 inches on 12 days. Maximum, 0.97 inch, on 14th.

DUNMANWAY.—4.60 inches fell on 19 days. Heaviest falls were 1.03 inches on the 13th and 0.60 inch on the 16th. The observer writes:—Rain was much appreciated by farmers, and crops are looking very well. The cold winds of April had kept back vegetation. The last week of May was very fine and warm, with only .04 inch rainfall. The fall for five completed months of 1919 is 0.06 inch less than the average.

PERISCOPE.

INFLUENZA.

AN important discussion on Influenza took place at the Royal Society of Medicine on November 13, 1918. It was introduced by Sir Arthur Newsholme, K.C.B., M.D. In concluding his remarks he indicated a few early desiderata in the investigation of the disease. They were as follows:—

"(1). It would greatly facilitate further investigation if epidemic catarrhs, whether influenzal or other, were studied bacteriologically, especially in their early stages, in selected populations, *e.g.*, of institutions, and if a similar study were made of cases of bronchitis and of pneumonia in different localities and for a series of years. The work already began by the Medical Research Committee will doubtless be of value in this and other directions.

"(2). If such collective information is to have its maximum utility it will be necessary to ensure that observations by different bacteriologists are made by comparable methods.

"(3). The study of the epidemiology of influenza during the war has been hampered by the necessary secrecy as to military and naval outbreaks, and by the failure of the ordinary international information coming into our official possession from consuls, foreign journals, etc. It will be possible partially to piece together the story of the present outbreak from the reports which Medical Officers of Health have been requested to prepare; but information from the Services will be needed to furnish a less incomplete story."

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PART I.

ORIGINAL COMMUNICATIONS.

ART. III.—*Note on ease of Removal of Foreign Body from the Lung.*[a] By LT.-COL. SETON PRINGLE, F.R.C.S.I., Surgeon to Royal City of Dublin Hospital; O.C. Irish Counties War Hospital.

THE advisability of removing a projectile which has been retained in the lung long after the wound has healed is a question which every surgeon engaged on war work is called on to decide from time to time.

I do not desire to debate the subject in this paper, and indeed the proper line of treatment to be adopted in these cases has already been fairly well established.

It may be taken that a rifle or shrapnel bullet or a small piece of shell may lie in the lung for years without causing symptoms or apparently injuring the tissue of the lung. All such cases are best left alone, whereas a large irregular fragment of shell generally leads to trouble and should be removed.

In the case which I want to describe on this occasion a rifle bullet was lodged in the lower lobe of the lung for two-and-a-half-years. But the patient suffered considerable

[a] Read before the Section of Surgery in the Royal Academy of Medicine in Ireland on Friday, November 8, 1918.

pain with any exertion, and I felt justified in advising its removal.

The Notes on the case are as follow :—

Private A. W., aged 28, wounded on the 6th of April, 1916, by a bullet entering below the apex of the left scapula; there was no wound of exit. He had severe hæmoptysis for several days after the receipt of the injury, He spent two-and-a-half months in hospital, and then returned to his unit at home, but on account of pain in the chest on any exertion, he was unable for ordinary duty, reporting sick on many occasions, and being in several hospitals at different times before arrival here.

On examination the healed wound was seen in the back of the left chest. An X-ray examination revealed the bullet lying in the lower left lung, apparently in the tongue of lung tissue which lies in the sulcus between the diaphragm and the lower posterior thoracic wall.

Operation.

Ether by the intratracheal method was administered by Captain Crawford. Four inches of the seventh rib were excised sub-periosteally from the mid-axillary line backwards. Before opening the pleura, I was able to free it by blunt section from the under surface of the ribs above and below, and also at either end of the incision—thus mobilising the pleura to an unexpected exent. On opening the pleura no adhesions were found. The hand was passed into the chest and grasped the part of the lung involved, which was delivered through the incision, and then caught in a rubber-covered forceps. The bullet was easily felt about an inch deep in the lung. An incision was made over it, and it was easily extracted. The space in which it lay was swabbed with ether, and obliterated by two mattress stitches of catgut, which completely controlled the slight hæmorrhage present. The whole area involved was buried by a continuous Lembert suture of the visceral pleura. The part of the lung which had been withdrawn from the chest was sponged with

ether and returned to the thoracic cavity. The parietal pleura was then sutured by a continuous mattress stitch everting the edges, the mobilisation mentioned above allowing this to be easily performed.

Before the last stitch was tied Captain Crawford was able to expand the lung tightly against the pleura, thus expelling the air from the pleural cavity. The muscles were stitched in two layers, and the skin was united with a continuous suture. No drainage was employed. Immediately after the operation air could be heard entering the lung freely.

The patient made a rapid recovery without interruption apart from a mild bronchitis of both sides and a slight amount of localised surgical emphysema. Two days after the operation Major Harvey, O.i/c Medical Section, reported :

"Rhonchi can be heard in both lungs; the voice is not quite so well conducted on the left side. No pleural or pneumonic sounds are to be heard."

I was agreeably pleased at the ease of the whole procedure. This was undoubtedly due to the intra-tracheal anæsthesia so ably administered by Captain Crawford with his own apparatus. He was able to allow the lung to retract at will, or on the other hand could so expand it that it bulged from the wound. The number and force of the respiratory movements were entirely under his control, so that when required the patient could be put into a condition of apnœa, thus greatly facilitating all manipulations, permitting accurate suturing, &c. In my opinion this method of anæsthesia places the surgery of the chest on quite a new basis, and leaves the surgeon entirely independent of positive or negative pressure chambers. Captain Crawford is to be congratulated on being the first to introduce this method to Ireland. I was also greatly struck by the toughness of the lung tissue and of the pleura which held sutures admirably. The bullet immediately on removal was dropped into culture media, but proved sterile.

Art. IV.—*Secondary Suture of Wounds.*[a] By R. Atkinson Stoney, F.R.C.S.I.; Visiting Surgeon, Royal City of Dublin Hospital; Médecin Major 2ème Classe Armée Francaise; late Médecin-en-Chef, Hôpital de Lamothe, Villeneuve S/Lot; late Operating and Consulting Surgeon, V Section XVII Région.

At a meeting of the Surgical Section of the Academy of Medicine on the 11th of January, 1918, I showed some soldiers who had been wounded in the Cambrai offensive in the previous November, and on whom I had operated at the Royal City of Dublin Hospital by cleaning their wounds with Bipp and suturing them. I was so struck with the success of these cases that I determined when I returned to France last spring to put this method into practice on a large scale. When I first arrived in France early in May, 1918, I found that nearly all the cases in the hospital had been wounded for a considerable time, and there were only three or four cases that were at all suitable for suturing. These cases were operated on with satisfactory results, and on the 2nd of June, 1918, we received a large convoy of soldiers direct from the front who had been wounded from four to seven days previously. Practically all these cases were sutured within a few days of their admission, and the results so completely confirmed my previous experience that for the rest of the time I spent in France almost every recently wounded soldier was submitted to an operation of suture within a few days of entering the hospital.

The Bipp that I have used is made as follows:—2 parts of iodoform, 1 part of bismuth, 12 parts of vaseline, and enough hard paraffin to give the preparation the consistency of butter. This modified Bipp has the following advantages over the original Bipp:—(1) Its cost is about one quarter; (2) it never produces symptoms of intoxica-

[a] Read at the Surgical Section of the Royal Academy of Medicine in Ireland on Friday, January 31st, 1919. Illustrated with Lantern Slides of cases before and after suture.

tion, even when used in very large quantities; (3) it can be smeared more easily and evenly over the tissues; (4) when the wound is closed the excess is automatically squeezed out; (5) it never cakes or forms a hard lump to act as a foreign body in the wound.

Much has been written on the distinction between delayed primary and secondary suture, but in the cases on which this paper is founded the classification depends simply on whether it is necessary to excise the skin edges or not. When the edges are not excised the operation is spoken of as delayed primary suture, and when they are excised it is secondary suture. The great majority of the operations performed were secondary sutures.

We found that, as a rule, delayed primary suture could be practised up to about the seventh or eighth day after the infliction of the wound, and that after that date secondary suture was necessary, though on one occasion I performed delayed primary suture as late as the eleventh day.

The steps of the operation are as follows:—After cleaning the wound and surrounding skin with ether and iodine —(1) The granulation tissue, if present, is removed with a sharp curette. (2) The skin edges are separated by blunt dissection all round the wound for a considerable distance, varying with the size of the wound and the loss of tissue; the greater the loss of tissue the greater will be the tension on closing the wound, and the greater, therefore, the necessity of freeing the skin widely. In the case of extensive wounds it was found advisable to make the lines of separation between the superficial and deep fasciæ, so as to ensure a good blood supply to the skin. (3) The skin edge all round the wound is removed with sharp scissors; as a rule this removal should be as economically done as possible. (4) The whole wound thus made is dried thoroughly, any bleeding points being tied with fine catgut, then swabbed with ether or methylated spirit and packed for a few moments with gauze wrung out of one or other of these liquids. (5) The wound is completely

covered with Bipp, which is thoroughly rubbed into the tissues, and into all pockets or crevices, with a piece of gauze, also freely smeared with Bipp. (6) The tissues are sutured in layers with catgut, so as to obliterate as far as possible all dead spaces. One, two, or three layers of catgut suture may be employed to unite the muscles, and a separate layer is always used for the deep fascia. These sutures may be either interrupted or continuous; usually the latter were employed. (7) Finally, the skin is united by thick silk impregnated with Bipp. Where there is no tension on the skin a continuous suture of fairly fine silk may be used, but where there is tension, interrupted sutures of thick silk should be placed about every half-inch, passing through the skin from half to one inch from the edges of the wound and including the whole depth of the superficial fascia, and in the centre of the incision it is well to include also a little of the deep fascia, so as to anchor down the skin to avoid the formation of hæmatomata. Superficial sutures of silk-worm gut should be placed between the silk sutures, so as to obtain good coaptation of the skin edges, which is most important for early and sound healing. The wound is then dressed with gauze smeared with Bipp, a thick layer of wool, and a tight bandage. Slight variations of this routine may be found advisable in certain cases: for instance, in small wounds the whole wound may be completely excised by the knife, or this may be done at least to the superficial part of the wound, and the separation of the skin edges undertaken afterwards. In old-standing wounds, of a month or more, it is advisable to excise the whole wound, or if this is not practicable, to dissect away as much as possible of the thick layer of fibrous cicatricial tissue which underlies the granulations.

Some irregularity of temperature is fairly common after these operations, and if not accompanied by persistent pain does not necessarily mean sepsis (using the word in its clinical and not its pathological sense). If temperature or pain, or both, continue after the third

day the wound should be dressed and possibly one or two superficial sutures removed to give exit to a mixture of broken down blood and Bipp, seldom or never true pus. On no occasion was it necessary to remove all the stitches, even in the few cases which suppurated freely. And only quite exceptionally was the removal of a silk suture necessitated.

If there is no continued rise of temperature or pain the case need not be dressed till the seventh or eighth day, when the superficial sutures are removed. As a rule, however, in the case of large wounds, or where there was much tension on the stitches, I made a practice of removing the dressing and looking at the wound on the fourth day. The deep silk sutures should be removed from the tenth to the twelfth day. Rutherford Morrison recommends the removal of the sutures at the first dressing from the tenth to the fourteenth day, or even later; but we found that nothing was to be gained by leaving these sutures so long, as they only tended to irritate and cut through the skin. Occasionally it must be admitted, the sutures were removed too soon, but that was in the earlier cases, when they were usually removed about the eighth day. In cases where there was considerable tension, and a liability of the wound reopening or stretching, it was found advisable to keep the edges approximated by strapping for a week or ten days after the removal of the sutures. Experience proved that broad mattress silk sutures, even when protected by rubber tubing, did more harm than good, as they tended to strangulate the tissues and cause sloughing of the skin edges. Among our earlier cases were some which clearly demonstrated this. It is far better when there is great tension to content oneself with partial closure of the wound, and so avoid the risk of sloughing, which will cause a larger unhealed area than if the wound had only been partially closed. One of the greatest difficulties in these operations is to decide how much tension may be used with safety in order to close the wound, one wound healing normally though sutured

under considerable tension, whereas in another wound, where the tension is not so great, the sutures cut through and infection occurs. Experience alone can help the operator to decide this point. As a result of our experiments with various materials we decided that sutures of thick silk impregnated with Bipp and placed at intervals of half to three-quarters of an inch were the least liable to cut through. Michel's clips were found useless, as owing to the moisture of the wound they cut through, and we, therefore, used superficial sutures of fine silk-worm gut.

The majority of cases that came to our hospital might be divided roughly into two classes—first, those that came directly from the front, and who arrived from the fourth to the fourteenth day after they were wounded, and secondly, those who had already passed some time at a base hospital, usually at Paris, and who, therefore, did not arrive till a month or more after they had received their wounds. The condition of the wounds in these two cases differed to a marked degree. The wounds of those who came from the base hospitals were always thoroughly septic, many being cases of compound fracture, suppurating freely. As a rule, it was impossible to suture them, until by dressing them every two or three days with Bipp for a few weeks we had reduced the acuteness of the infection. At the end of this time, however, specially if the wound involved only the soft parts, we were frequently able to excise the wound freely and perform an operation of suture with satisfactory results. On the other hand, the cases which came directly from the front had practically all been operated on there, and the wound freely excised: on arrival the wounds were, as a rule, plugged with gauze which had been soaked in ether or Mencière's fluid (a mixture of alcohol and ether, with small quantities of iodoform, guaiacol, eucalyptus and balsam of Peru), the dressing had not been changed for 48 hours or more, and the wound was generally in a stinking condition, with a considerable discharge, which had already soaked through the voluminous dressings.

These cases were dressed immediately on admission, washed with Dakin's solution, the plug removed and the wound filled with Bipp, and covered with gauze freely smeared with Bipp; this dressing was repeated every second or third day, and from three to eight days after admission the case was, as a rule, considered ready for suture. It was quite the exception to find a case which did not improve and become healthy in appearance under this treatment. It was remarked that certain cases which were on admission in a poor state of nutrition or depressed vitality, or which had a marked tendency to superficial infection of the skin (as shown by multiple boils or acne) were more liable to present some infection of their wounds after suture. It was found advisable to delay operation until their general condition had been improved by rest, good feeding and tonics. One case, when dressed on admission, showed symptoms of advanced gas gangrene. It was a case of flapless amputation through the upper third of the left arm. The wound had not been dressed for three days, and on removing the dressings it was found that the muscles exposed in the stump were black and crepitating, and there was emphysema of the whole of the left side of the chest, back and front, and of the base of the neck. Incisions were made over the chest and the case was treated with Dakin's solution and hydrogen peroxide; within a few days the sloughed portions of the stump were cut away and the gas disappeared from the tissues, and the stump and wounds were dressed with Bipp. Twenty-four days after admission the man was operated on, the skin and superficial fascia were dissected up from the stump and axilla, the muscles were separated and the bone divided through the surgical neck; the muscles were then sutured over the bone with catgut and the skin completely closed over the stump. Bipp, of course, was freely used. This case, a pretty severe test, healed completely without any rise of temperature, though a little clear serum had to be let out from under the skin, and the patient left hospital with a sound painless stump one month after operation.

The cases which arrived with a profuse stinking discharge were probably infected mainly with saprophytic organisms, and this may explain why they cleared up so rapidly under our treatment and allowed early and successful suture. After a little experience we found that two classes of cases were specially liable to go septic after suture—(1) Those which arrived at the hospital with a drainage tube; (2) those which had been partially stitched at the front, specially when the stitches had in whole or part cut through. It might be said that this resulted from the fact that these cases were more seriously infected than others, but I do not think that this was the explanation. In the first case the tube, which was usually of thick rubber and pushed through a limb from one wound to another and left in the wound without removal for three days or more during the patient's journey from the front to our hospital, caused by its continual pressure sloughing and consequent infection of the central part of the track, specially if it was in the neighbourhood of a bone. This it was difficult or impossible to remove at the subsequent operation of suture. In the other class of cases there was usually one mattress suture or a few interrupted sutures of thick silk-worm gut passed widely through the tissues and tied under considerable tension, with resulting stitch abscesses. At the operation of suture it was generally impossible to excise these stitch-holes without sacrificing too much skin, and in spite of all precautions the new line of suture was liable to become infected from the old suture tracks.

Towards last autumn delayed primary suture was largely practised at the ambulances at the front, so that we got many cases in which one or more wounds had already been sutured, but which also had unsutured wounds, these having been left unsutured because they were too infected or could not be easily closed owing to extensive loss of tissue. These cases we operated on as freely as others and with excellent results; in fact, we had cases of multiple wounds, where some of the wounds,

presumably the most favourable, had been sutured at the front unsuccessfully, and where we sutured with complete success the other wounds, which the surgeons had not seen fit to attempt at the front.

Owing to the fact that there was not a pathologist within fifty miles of us, it was imposible to examine our cases bacteriologically, or control our operations by daily counts of the bacteria of the wounds. However interesting this might have been from a scientific point of view, from a practical point it would probably have proved quite an unnecessary labour, and, in fact, might have led us to put off operations which had proved successful. As our hospital contained only 110 beds and as fresh convoys were continually arriving, our great object was to get cases healed as quickly as possible. As a rule no case was discharged till he was ready to go for a short convalescence to his own home. The fact that we passed over 500 men, all more or less serious surgical cases, through the hospital in seven months, proves (I think) the practical success of our methods.

With regard to the relative merits of the two operations, delayed primary and secondary suture, the former has the great advantage of being simpler, more quickly performed. It does not necessitate any cutting and disturbing of the tissues, and is therefore less likely to cause a lighting up of fresh sepsis. It can, however, be performed only within a limited period, and unless done very early leaves a well-marked scar. Secondary suture, on the other hand, can be performed at any time; some of our cases were sutured two months or more after they were wounded. In successful cases, where there is not too much tension, the scar is as slight as after an ordinary clean operation. In one patient with two large similar wounds on the thigh, I closed one without excising the edges, and the other with excision, and the difference between the two scars was most striking, although they both healed cleanly and at once. The relative disadvantages of secondary suture are that it is a more ex-

tensive and troublesome operation, and owing to the free cutting and opening up of the tissues there is a greater likelihood of the occurrence of extensive sepsis. As these cases show, in delayed primary suture we had 83.9 per cent. of normal healing and no cases of extensive or prolonged suppuration, whereas in our secondary suture cases we had 70.3 per cent. of normal healing and 6.2 per cent. of extensive or prolonged suppuration. Undoubtedly, if we had been able to choose our cases or to wait longer before operating, we could have shown better statistical results. In judging them it must be remembered that we made a rule of operating on every case as soon as possible after its admission into the hospital, and that the object in view was not a high percentage of normal healing but as rapid a cure as possible in every case; and it is quite evident that a case may leave the hospital healed in spite of slight suppuration at a much earlier date than if a considerable time was occupied in preliminary treatment and was followed by normal healing.

As may be seen from the first table, most of the cases were severe, only 23 out of 159 being superficial, 102 involved the muscles. In many of these cases the bones were exposed but not fractured, and 33 cases were complicated by fractured bones, and there were 5 cases of re-amputation. In fact, the only kind of case which was considered quite unsuitable for suture, was an old compound fracture which was already freely suppurating, and even that might be attempted if it was at all possible to excise the fractured ends of the bone. In re-amputations especially is it necessary to operate as early as possible, as owing to the contraction and fibrosing process which occurs in the muscles, the length of bone that has to be sacrificed is proportional to the length of interval between the primary and secondary operations. It is, therefore, much better to operate on these cases early, within three weeks of the date of the flapless amputation, and risk a mild amount of suppuration, than to wait longer, even though by that means normal healing is obtained. In

our five cases of re-amputation there was a slight amount of suppuration in three—extensive suppuration (which cleared up quickly) in one—and no suppuration in the others, but in all cases we were able to close the stump completely with a sacrifice of not more than one and a half inches of bone, though in every case on admission to hospital the bone was either flush with the end of the stump or actually projecting freely beyond the soft tissues.

In the second table are given the results of the operations classified according to suppuration. By normal healing it is meant that the wound healed at once without any suppuration or complication, except that in a few cases (a very few) a small hæmatoma formed, or a little clear yellow serum had to be let out. In the second group, healing with slight suppuration, are included all those where there was the slightest formation of pus, though in many of these cases it was not found necessary to remove any of the sutures to give exit to it, and as soon as it was evacuated, usually by the insertion of a probe between the sutures, the healing took place rapidly. In the last group, those in which the suppuration was abundant or long, are included all those cases where the suppuration involved the greater part or whole of the wound, or did not clear up quickly. Even in these cases it was never found necessary to remove all the sutures, and though the operations could not be looked upon as successes, so far from being useless, they certainly greatly shortened the patient's stay in hospital. In only one case did this exceed ten weeks (see Case V.). After leaving our hospitals our patients had to pass a Medical Board, from which they were usually sent to their homes for fifteen to thirty days' convalescence, very rarely for longer, after which they returned to their unit at the front, so that many of our cases were in the fighting line within two or three months of being wounded. When compared with the results obtained before the introduction of secondary suture, these results are remarkable, a large flesh wound in previous years often remaining for six months or longer in hospital, and

even when healed, being partially or wholly incapacitated by an extensive and adherent scar from continuing his military duties. The difference in the usefulness of the hospital after the adoption of these methods is shown by the following figures, which cannot be altogether explained by the greater activity of hostilities during last summer compared with other periods. During the seven months from May to November the number of patients admitted was one quarter of the total number since the war started, and the number of operations performed was more than one-third. Among all our cases we had no serious complications, there was no single case of secondary hæmorrhage, and the only two complications were one case of phlebitis of the saphenous vein in a man with a partial fracture of the tibia, and one case of right-sided pleurisy in a case of partial fracture of the left femur.

The following is a very brief description of a few typical cases :—

Case I.—Soldier wounded May 31st, 1918, by shell splinter. Admitted to hospital 2nd June, 1918. Wound of skin and superficial fascia 5½ inches long, middle of outer side of right thigh. Operation 4th June, 1918, delayed primary suture. First dressing 12th June. Stitches all removed. Healed. Discharged 18th June, 1918.

Case II.—Soldier admitted 2nd June, 1918. Wounded right upper arm by bullet on the 31st May, 1918. Extensive comminuted fracture of lower third of humerus, wound 5 inches long posterior aspect of arm, 2½ inches broad. Operation 10th June, 1918. Muscles separated, clot and serum evacuated, some bone splinters removed; large gap in bone. Muscles sutured with catgut, deep fascia sutured, skin edges pared and sutured. Put on internal angular crutch splint. Dressing removed 14th June; wound dry and clean. June 21st stitches removed; healed. Splint removed 27th July, 1918; fracture consolidated.

Case III.—Soldier wounded 24th May, 1918. Admitted 13th June, 1918. Long wound 3 inches inner side of

upper third of right leg. Wound $1\frac{1}{2}$ inches long, just above inner side of right knee. Operation 15th June, 1918. Both wounds completely excised; lower wound involved the muscles; both sutured. Dressed for first time June 23rd; all stitches removed; both wounds healed.

Case IV.—Soldier admitted 13th June, 1918. Wounded 26th April, 1918. Large horizontal wound $5\frac{1}{2}$ inches long below posterior border of right ribs. Operation 17th June, 1918. Excision of whole wound; in front the scar was adherent to the ribs. Sutured in three layers; dressings removed on 22nd June; clean and dry. Stitches removed 26th June. Discharged from hospital 9th July, 1918.

Case V.—Soldier admitted 4th July, 1918. Wounded 19th June, 1918. This soldier had a wound 7 inches by 3 on the upper and inner aspect of the right thigh extending down to the knee. Another wound 3 by $1\frac{1}{2}$ inches on the lower and outer aspect of the right thigh. A third wound 9 by 3 inches on the back of the left calf, through which the posterior tibial vessels had been tied, and a fourth wound in the middle of the left erector spinæ. All these wounds were sutured on the 8th of July, 1918. The wound on the outer side of the right thigh healed at once, and the stitches were removed on the eighth day. The wound on the back also healed at once, but the scar stretched afterwards. The wound on the back of the right thigh healed in its lower half, but the upper half reopened and was sutured on the 25th of July, after which it healed rapidly. The wound of the calf healed in the deeper part, but the skin gave way and the surface refused to heal until the scar was excised and the skin resutured on October 30th, 1918. It then healed at once, and he was discharged from hospital on November 19th, 1918. This is the only patient in the series who remained more than 10 weeks in hospital.

Case VI.—Soldier admitted 6th August, 1918. Wounded by bullet 1st August, 1918. This soldier was shot through the anterior fold of the right axilla; the bullet smashed the humerus near the centre and lodged; it was

removed along with loose pieces of bone through a long external incision. There was also a wound on the inner side of the arm. Operation was performed on 8th August. The inner wound was bipped and sutured. The bone was explored through the outer wound; it was found very extensively smashed. A couple of loose splinters were removed, and after bipping, the muscles deep fascia and skin were sutured. The first dressing was on the 17th, when the stitches were removed. The splint was removed on the 3rd September, when all the wounds were healed and the bone was well consolidated. He was discharged on the 17th of September, 1918.

CASE VII.—Soldier admitted 27th September, 1918. Wounded 17th August, 1918, by shell splinter. This man presented a large irregular wound from the middle of the left clavicle to below the insertion of the deltoid; it extended to the infraspinous fossa behind and down the anterior fold of the axilla in front. The outer half of the clavicle, the acromion, glenoid cavity, the greater part of the spine of the scapula and the head, neck and upper part of the shaft of the humerus were lost. This extensive wound was suppurating freely, the necrosed end of the clavicle was projecting and the upper end of the shaft of the humerus was exposed at the bottom of a suppurating cavity. The case was dressed with Bipp every second day, and on October 2nd an operation was performed; the outer end of the clavicle was freed and sawn off; the upper end of the humerus was removed with rongeur bone forceps. The granulations were scraped away and the skin was separated widely and its edges removed. After bipping the muscles of the back were sutured to those in front, and the skin was finally completely closed in a ⅄ shaped manner. On the 6th the wound was dressed and some broken down blood let out of the middle of the wound. On the 10th all the stitches were removed and some blood let out from the junction of the incisions. Most of the wound was soundly healed. On November 11th the whole wound was healed except for an area 2 inches by ¾ along the posterior fold of the axilla. This was excised and resutured and healed

rapidly, and the patient was discharged on the 3rd December, 1918.

Attention must be drawn to the great advantages of this method of treatment from the patient's point of view in saving him pain during the treatment and reducing his final disability. The advantage of a comparatively linear non-adherent scar over an extensive adherent scar need not be laboured. Painful dressings cease to exist once this preparation is used. The dressings, thickly smeared with Bipp, can be lifted off the wounds without pain, both before and after operation; and it is remarkable to see the great improvement which occurs within a few days, both physically and morally, in a patient when painless dressings have been substituted for painful. It is by no means always realised how much the pain and dread of an extensive daily dressing retards the patient's improvement, and even the actual healing of his wound.

Table I.

—	Superficial	Deep, affecting		Re-amputation	Total
		Muscles	Bones		
Delayed primary suture	10	15	6	0	31
Secondary suture	13	83	27	5	128

Table II.

—	Healing by first intention	Slight suppuration	Incompletely closed		Prolonged or abundant suppuration
			Healing by first intention	Slight suppuration	
Delayed primary suture	23 (74.2%)	5 (16.1%)	3 (9.7%)	0	0
Secondary suture	83 (64.8%)	29 (22.7%)	7 (5.5%)	1 (0.8%)	8 (6.2%)

ART. V.—*Notes on Cholera Asiatica and its early treatment.* By AMOS GEORGE VARIAN, M.D. Univ. Dubl.; Captain, R.A.M.C.

THE earliest references to Asiatic cholera are to be found in old writings of China and Japan. It is a specific disease endemic in the East, where it is constantly to be found, and has therefore been termed "Asiatic" from the Continent which may be considered to be its natural home.

As an epidemic, however, it has visited Europe and the West in severe form, at least on four or five occasions during the last 100 years, advancing through Afghanistan and Persia or *viâ* Russia and the Red Sea to Turkey and the Balkans. It has been markedly associated with wars, the conditions of which naturally supply greater possibilities for its distribution and spread, owing to forced unhygienic conditions and the movement of cholera carriers, human or material, from infected areas. The late war has proved no exception to the rule, for cholera has appeared in various parts of Russia, Poland, Austria and the Balkans. It did not affect the Allied Armies in the West, however, but made its appearance among our troops in Mesopotamia and the Persian Gulf during the campaign there, in the form of a small local epidemic or as sporadic cases. Here we had excellent opportunities of studying this interesting disease, its prophylaxis, diagnosis and early treatment.

In no disease have scientific methods proved so fruitful of good results than in their application to the study of cholera. All branches of scientific thought, working along their own paths of knowledge and research, have concentrated on the prevention and cure of the disease. The hygienist, the chemist, the chemico-physiologist, the bacteriologist and specialists of all kinds have all supplied their facts and findings, and the physicians have accepted them, compiled them, and evolved a general treatment,

the result of which has been to reduce the mortality from 80 per cent. to 11 per cent.

It is only very lately, too, that this wonderful reduction has been achieved; practically speaking, in the last few years.

With regard to the ætiology and bacteriology the mode of infection of cholera is chiefly through the water supply, and is found in the organic impurities of the sediment. The fæces of a sufferer contaminates the water, and can thus reinfect others. "Carriers" of the disease, in the form of persons suffering from a mild cholecystitis, have now been proved to be possible, so that the fæces of apparently healthy people may act as a source of infection. Food, sugar, sweets, and clothing may also be a means of transmitting the disease.

Cholera is a specific disease due to a slightly curved, motile, flagellated, comma-shaped bacillus, known as Koch's Vibrio Choleræ, discovered by him in 1883. It can easily be grown on alkaline culture media such as Dieudonnés blood agar, but is immediately destroyed by the weakest acid preparations. Various elaborate tests have been used to differentiate it from other vibrios and cholera-like strains, the most reliable one being the serum agglutinating test. The cholera-red reaction is not diagnostic. The vibrios first appear in the neighbourhood of the ileo-cæcal valve—in the ileum, cæcum and appendix.

With reference to the pathology in *post-mortem* examinations, I found the following conditions present:—Evidence of extreme toxæmia, dry tissues, sticky dry peritoneum and a rose coloration of the aorta, with yellow streaks in the intima. Also acute catarrhal enteritis, the contents of the intestine being a milky fluid, opalescent in appearance, and the absence of formed fæces was noted. In all cases there was a dry, shrunken spleen, while the kidneys varied in appearance, sometimes congested with tense capsules but in other cases normal. There was, without exception a contracted and empty urinary bladder, also marked enlargement of Peyer's patches and lymphoid tissue in gut. And broncho-pneumonia in one case was found.

Symptoms.—The symptoms of the disease are such as one would expect from the pathological findings.

Cholera presents a very typical clinical picture, but in my opinion it is impossible to divide the symptoms of the disease into clearly defined stages that are so dramatically described in the various text books. They may for convenience be divided into three periods :—

1. Invasion period, the first twenty-four hours of the disease.
2. Acute or algide period, which lasts from possibly a few hours to three or four days.
3. Reaction period, when the acute symptoms have subsided. Thus the collapse stage of cholera, described by older writers, may occur early or late in the course of the disease, and really should not happen at all if the case has been seen early enough.

The uræmic stage is not a necessary state, and may not be marked in a well treated case; it occurs if anurea is permitted to last for a considerable time, the severity of the uræmic symptoms depending on the length of time the kidneys have been allowed to remain inactive. Collapse, uræmia and hyperpyrexia are to be looked on as accidents or complications in the course of the disease, and not as incidents in its normal progress.

Invasion Period.—In our experience the earliest symptom is depression, nervousness and sense of impending disaster. It existed up to twenty-four hours before the actual marked onset of the acute stage.

The "premonitary diarrhœa" spoken of by various authors was not noticed, dysentery and diarrhœa being so universal amongst the troops that this may have been easily overlooked. When it did start, the diarrhœa was sudden, violent, and almost at once developed into the typical colourless, copious evacuation which is such a remarkable feature of the disease.

There were, however, as well as the depression symptoms, marked thirst, weakness, and dyspeptic phenomena at the early period. It would be difficult, if not impos-

sible, to diagnosticate cholera now, but a few hours later on the disease becomes more acute and the clinical diagnosis is a simple matter.

Acute or Algide Period.—There is the sudden onset of profuse and continuous diarrhœa, which is absolutely colourless and bile free. It has a "milky-water" consistency and pours from the patient in a continuous stream. Vomiting is occurring at the same time, and is remarkable also, like the copious evacuation of the bowels, for the quantity of clear fluid which is out of proportion altogether to the possible amount of fluid swallowed.

There is extreme prostration, the patient is unable to move, while agonising cramps attack the muscles of the extremities. The more muscular the patient the worse the cramp, and Europeans suffer more in this respect than the natives.

At this time the anguish and acute sensibility of the sufferer is most marked. He knows of his condition and cries for help in a voice which, at best, is little above a whisper. The pinched, old-looking face, shrunken skin and eyes, the lifeless shrivelled fingers, together with the cold, moist skin and shallow, rapid respirations, are almost constant features. The thermometer fails to register externally, though may show a temperature of 105° in the rectum.

The blood pressure is gradually falling, and the pulse cannot be felt at the wrist. Collapse is only too common an occurrence at this stage, and, unfortunately, it is in this condition that the patients are usually brought in for treatment. Collapse is so profound that it is often difficult to realise that life exists. The heart sounds are almost inaudible, and often the pulse cannot be felt in the brachial artery. There is no conjunctival reflex, and the passage of a urethral catheter discloses the absence of urine in the bladder.

A dangerous sign in this condition is the sudden stoppage of the profuse diarrhœa and vomiting. Respirations are so shallow and rapid that they are almost imperceptible. The blood pressure is too low to be

measured at the wrist, and even before collapse occurs is commonly only 50 or 60 millimetres of mercury, but, even in this condition, recovery is quite possible with active and urgent treatment.

Reaction Period.—If treatment succeeds in pulling the patient through the acute period of the disease, he gradually passes into the stage of reaction, or to actual recovery or convalescence. This change of condition is ushered in by the gradual return of the vital functions; warmth slowly returns to the skin, the pulse to the wrist, the respirations become deeper and stronger, and urine is again secreted. There is gradual cessation of vomiting, and the diarrhœa becomes fæcal in type and then ceases. Normal sleep is obtained by the patient for the first time, and convalescence may follow in a few days. I have seen a sufferer walk out of hospital four days after having been admitted in an advanced state of collapse in the acute period of the disease, but usually the patient has a reaction phase, in which any complications may occur (and so it has been considered by many writers the most dangerous period of the disease). During this phase there is delirium of a low typhoid type, with a febrile condition of greater or less severity. Fatal hyperpyrexia is to be watched for, and has been responsible for a large percentage of deaths.

This typhoid state may last any time up to one month, and it was in this condition that we usually lost sight of our cases, as it was then possible to remove them to a General Hospital. Uræmia was a great cause of mortality in this reaction period, but since the use of alkalis and improved routine it is much less to be feared. Broncho-pneumonia, skin-lesions, asthenia, coma and convulsions, though common features of the disease in the past, are now much less frequent.

Treatment.—Little can be gained by the study of the older treatments of cholera, for examination of the percentage mortality of the disease shows little improvement up to quite a recent date. The old treatment consisted of modifications of the following :—phlebotomy, purging, or

evacuation treatment, and the administration of opium, lead and such-like astringents.

In 1907 the mortality for Europeans was 80 per cent., and for natives 60 per cent. in Calcutta. The chief credit for the wonderful reduction since then is directly due to the splendid work of Leonard Rogers and his co-workers in the Calcutta School of Medicine. In 1913, with the introduction of his system, the death rate in the same locality was 20 per cent. and has now been further reduced.

Their treatment is based on investigation into the circulatory and blood changes in cholera, with special attention to the loss of chlorides and salts, the elimination of toxins, uræmia and acidosis.

The main principles of the Leonard Rogers' treatment are as follows :—

1. Replace the lost fluids and salts by hypertonic saline intravenous injections, of sufficient amount to raise the blood pressure to normal, if possible, so as to ensure a rapid excretion by the kidneys. Do not wait until collapse occurs; watch the blood pressure and retain same at above 105 mm. if possible.

2. Freely administer, by the mouth, oxidising agents to destroy the exotoxins of the organism in the intestinal tract.

3. Stimulate the heart and vital internal secretions.

4. Carefully watch and control the temperature in the reaction period.

5. Continue to observe the blood pressure and the specific gravity of the blood, and use all available means to maintain these at a point which will ensure a free excretion of toxins.

The great majority of cases come under observation in the acute period, and are then usually collapsed to a greater or less degree, and the great problem is to restore the circulation, revive the blood pressure and lower the specific gravity. Drugs to be useful must be given hypodermically, as no absorption can take place in the intestinal tract.

In replacing the lost fluid—

1. *Saline enemata* may be used in the reaction period when diarrhœa has ceased or become intermittent. In our experience they were practically useless and were rarely retained. They are absorbed only when the blood pressure is above 70 mm., and then to slowly to materially benefit the patient.

2. *Subcutaneous hypertonic saline injections* were freely used by us in the acute period, and may tide over the chances of collapse. In the state of collapse they remain unabsorbed where injected, and from many points of view it is a very inferior method to intravenous injection, but is useful in combination with it.

3. Intraperitoneal injection was not employed by us, and is considered not applicable to Active Service conditions, though advocated by Rogers, especially for children. It has the advantage of rapidity.

4. We adopted hypertonic intravenous injections in all cases. The failure and disappointment in the results of isotonic salines encouraged Rogers to use hypertonic salines on account of the extraordinary loss of salts, especially chlorides, as well as the loss of fluids, in cholera. He used hypertonic salines to combat this deficiency, and to maintain the high salt content in the blood, and so prevent the outflow of fluid through the damaged intestinal mucous membrane. We used the following strength in solution :—

Sodium chloride - - -	120 grs.
Calcium chloride - -	4 grs.
Potassium chloride - -	6 grs.
Water to - - -	1 pint.

We were fortunate enough to possess a sphygmometer of the Riva-Rocci pattern in the unit, and by this means the blood pressure was carefully watched in each patient. The specific gravity was easily taken by means of the drop system in known stock solutions.

A blood pressure of 70 mm. is the danger line of collapse and an indication for immediate injection. All

efforts should be used to bring this over 105 mm and the specific gravity as near normal as possible. As to the amount of saline the following table is advised :—

Specific gravity	1032	requires no injections.
,,	1066	requires 4 pints.
,,	over above	requires 6 pints.

There seems to be little tendency to œdema of the lungs, and failures are usually due to under-injection, and insufficient attention to the blood pressure and specific gravity.

The saline is run in at the body temperature in collapse, but if there is hyperpyrexia the injection is given at a temperature which is as many degrees below normal as the patient's temperature is above it. That is to say, as a general rule in febrile cases the injections are given at 70° or 80° F. The salines must not be too concentrated, as there is stated to be an osmotic reflex of toxin from the intestines.

The water must be pure, and free from contamination with dead organic matter, and this naturally might give rise to hyperpyrexia.

Post choleraic uræmia.—The treatment of uræmia and of the anuria is all important, and the decline in the mortality in the reaction phase is greatly due to the introduction of intravenous sodium bicarbonate injections, which have *lowered the post-choleraic uræmia mortality* by 70 per cent.

If the case is so severe as to require a second injection of hypertonic saline, even if post-choleraic uræmia does not exist, at each subsequent transfusion one pint of an alkaline solution of the following strength is first given :— Sodium chloride, 60 grs. ; Sodium bicarbonate, 160 grs., in one pint.

Technique.—As to the technique of intravenous salines it was almost invariably found necessary to cut down on a vein to insert the cannula. Before collapse, however, it is sometimes possible to use an ordinary salvarsan needle.

The saline was run in at the rate of about a pint in five minutes.

Destruction of Toxins in the Bowels.—The use of oxidising agents alone was a great advance in the treatment of cholera. Von Freudl in Vienna in the epidemic of 1914, used potassium permanganate as sole treatment, and obtained a considerable drop in the mortality of that time. Our experience shows that a solution of permanganate, of a transparent claret colour (about 6 grs. to the pint) can be given in unlimited quantities by the mouth; as much as 60 grains being given in 24 hours.

Potassium permanganate pills of 1 gr. strength were also used when the vomiting permitted; indeed, we found that this serious symptom was greatly relieved as soon as any of the permanganate was retained in the stomach. It has also been shown, definitely I think, that this drug has a curative action. Intestinal antiseptics, apart from oxidising agents, are now considered of little use, and theoretically may actually do harm by liberating more intracellular toxins for absorption. In combination with the treatment by hypertonic salines and oxidising agents, atropine (in 1/100 gr. doses) was used by us in signs of cardiac failure. Adrenalin has been used extensively of late by writers who claim that the toxins have a selective action on the suprarenals, and that by supplying this active principle they combat the vasomotor paralysis which is present. The use of astringents in the reaction phase is not advisable, and opium in all forms is to be avoided.

In conclusion I would say that definite statistics have not yet been published as to the results of the prophylactic treatment with anti-cholera vaccine, but there is reason to believe that great benefit has been obtained from their use in this respect. They were not used by us in the active treatment of the disease.

The opinion is expressed that yearly inoculation may be considered sufficient for permanent establishment of immunity, Spring being the most advantageous time, seeing that Summer and Autumn are the dangerous seasons.

Art. VI.—*Sleep: Normal and Abnormal.*[a] By E. H. C. Allen, B.A., Corresponding Secretary of the Dublin University Biological Association.

Introduction—Some of the greatest intellects of ancient and modern times from Aristotle downwards have been exercised by the problems of sleep, but such knowledge as we possess is of recent origin and is the fruit of the labours of a comparatively small number of workers. It is remarkable, in view of the fact that one-third of our lives is passed in sleep, that this condition did not claim more thorough investigation. From one point of view only did sleep notably attract the attention and interest of men; in dreams some anthropologists find the chief impulse to man's conception of his personality and to that of a general doctrine of spirits. The primitive man in his dreams finds himself engaged in activities similar to those of his waking life. He hunts, fishes and feasts, fights battles and braves dangers, and these visionary occurrences are to him just as real as the everyday occurrences which they faintly or vividly resemble. He learns from others that while these dream-adventures have been taking place his actual body has been lying motionless. He is thus led to a belief in a wandering double or other-self, which is temporarily absent in sleep and takes a final departure at death. Dreams of dead relatives and friends are interpreted as actual visitations of the ghosts of the departed and from this springs his idea of an after life. This dream-world is absolved from all limitations of space and time, and the secrets of the future may be revealed by good or evil spirits to him that can interpret his dreams aright. Throughout classic and mediæval literature we find a record of prophetic dreams, and that these tendencies have persisted to the present day among the more ignorant is evidenced by the circulation of numerous books on dream-interpretation. Lecky re-

[a] Read before the Dublin University Biological Association on Thursday, December 5th, 1918.

marked that the religion of one age becomes the poetry of the next, and certanly, whatever part sleep and its dreams played in moulding early religious ideas, it subsequently formed the theme round which poetic fancy was wont to roam untrammelled. Now, however, the poet must reckon with the physiologist and his plethysmograph. "Sleep, the twin-brother of Death," sings the poet; "the comparison, though picturesque cannot be justified," replies the physiologist, "for death implies the complete arrest of all the psychic and organic functions of the body, whereas in sleep the latter are operative and only a few of the psychic functions are suspended, the rest continuing to act with more or less modification." While the true nature of sleep cannot be determined until we have a more rational conception of what constitutes the actual physical basis of consciousness yet many instructive facts have come to light. The object of this paper is to deal, as briefly as possible, first with the physiology, and then with the pathology of sleep, referring in conclusion to some points in connection with its hygiene. The treatment of the psychological aspect of the subject is left, from consideration of space and personal ignorance, to some more capable pen.

PHYSIOLOGY.—"Sleep," wrote Schopenhauer, "is to a man what winding-up is to a clock." It is a period of anabolism, repair, and growth, during which the organism fits itself for renewed activity.

Onset—The state of sleep is one to which there is a periodical tendency, and in man and most animals the night, from its darkness and silence, is the natural period of repose. A feeling of fatigue or exhaustion is usually experienced when the waking activity has continued during a considerable portion of the 24 hours—a feeling that the brain requires rest. The attention wanders; yawning occurs; the eyelids become heavy and the sight blurred; the muscles relax and the head tends to fall forwards on the breast. The sense of sight is lost first, that of hearing last. The onset of sleep is sometimes

quite sudden, the individual passing at once into a state of torpor, but usually the transition is gradual and the mind remains for a variable period in a sort of "No man's land" between sleeping and waking.

Changes in the organism—What changes in the organism are associated with sleep? The eyelids are lowered, and the eyeballs turned upwards and inwards, the pupils being contracted. Voluntary muscles are relaxed, except the sphincters. There is a general diminution in the body metabolism as shown by the reduced output of CO_2. The character of the respirations alters; they become slower and shallower. The respiratory exchange is diminished. The inspiratory phase is more prolonged than in the waking state, and the thoracic type of breathing predominates over the abdominal.

Vascular system—The changes in the vascular system are of particular interest. Dr. Leonard Hill wrote:—"The vaso-motor centre is the hub round which turns the wheel of a man's active mental life." During sleep the heart beats more slowly and less forcibly, the peripheral vessels dilate, and the blood pressure diminishes. Sleep, however, is not a permanent or invariable state, but is subject to modifications by many factors, *e.g.* its duration, the time of the night, the character of the dreams, and the state of the organism generally. Variations occur in the volume of the thorax, abdomen, and limbs. Mosso's plethysmographic experiments demonstrated the enlargement of the limbs. More recently Howell has determined variations in the volume of the arm, observing that, from the moment the subject of the experiment closed his eyes and endeavoured to go to sleep, an increase in the volume of the arm within the plethysmograph was registered. With the onset of sleep the volume increased continuously and fairly regularly for 1-1½ hours, when it reached its maximum extent. This level was maintained for an hour or two, with certain rhythmic variations, and then the volume of the arm gradually diminished until about half an hour before final

conscious waking, when its rate of diminution became much accelerated. These phenomena are due to a diminution in the tone of the vessels of the arm leading to vaso-dilation, mainly of the cutaneous vessels. Similar changes occur in the peripheral vessels elsewhere over the general cutaneous surface of the body with the result that the arterial blood pressure falls. Since the amount of blood supplied to the brain is generally stated to be proportional to the velocity of the cerebral circulation, which in turn depends almost entirely on the general arterial pressure obtaining in the body, it follows that a fall in the blood pressure must entail a corresponding diminution of the cerebral blood supply. If this be so, Howell's observations must be interpreted to mean that during the period preparatory to sleep the blood-flow through the brain begins to diminish in quantity, and continues to do so for an hour or more after the onset of sleep; that after reaching its minimum the cerebral circulation, with temporary variations, remains nearly constant for one or two hours, perhaps longer, and then the amount of blood flowing through the brain increases in proportion to the rise in blood-pressure produced by the gradual recovery of tone in the peripheral vessels; and that this process becomes much more rapid just before waking, when the condition approximates closely to that prevailing before the onset of sleep. The association of cerebral anæmia with sleep is directly opposed to the older idea that during sleep the brain is in a condition of congestion and that the pressure of the blood by some means induces a state of repose. There is, however, further evidence to show that the older theory is erroneous. At a meeting of the British Association at Oxford in 1860, Durham gave an account of some instructive experiments carried out at Guy's Hospital. Among other things he said :—" A dog having been chloroformed, a portion of bone, about as large as a sixpence, was removed from the parietal region of the skull by means of the trephine; the subjacent dura mater was cut away and the surface of the brain exposed. As long as the animal continued under

the influence of chloroform, the smaller vessels of the pia mater were turgid with dark-coloured blood, and the larger veins were considerably distended. No difference in colour between the arteries and veins could be recognised. The exposed portion of the brain manifested a tendency to rise into the opening through the skull. By-and-by the immediate effects of the chloroform passed off, and the animal sank into a comparatively natural and healthy sleep. A very marked change in the appearance of the brain accompanied this change in the state of the animal. As sleep supervened, the vessels gradually emptied themselves; the veins ceased to attract notice by their distension; the exposed surface of the brain sank down to, or below, the level of the opening, and became pale in colour. In the course of a short time the animal was roused and irritated. A blush seemed to start on the surface of the brain; the vessels of the pia mater became fuller and fuller, and of a bright arterial hue. The contrast between the appearance of the brain during this state of functional excitement and the previous state of quiescence was most striking. The more the animal was excited, the fuller of blood did its brain appear to become, and the higher did the exposed portion rise above the general level. When the animal was allowed to return to its state of repose, the brain again sank down, and resumed its pale aspect." Further observations on this point made on subjects whose brains had been exposed by injury go to show that cerebral anæmia is a concomitant of sleep, and that the brain assumes a rosy hue and rises in the wound at the moment of waking. Mosso took graphic records of such cases, observing that the volume of the brain diminished during sleep, but that every stimulus, such as a sudden noise or light, though insufficient to awaken the sleeper, disturbed his repose and occasioned an increase in the volume of the brain. The same investigator placed a subject horizontally on a delicately poised balance. and found that on the appearance of sleep, the subject's head began to rise and his feet to sink, indicating that blood

must have left the head. The inclination of the body seemed to be proportional to the depth of sleep. Hooker states that in sleep the veins exhibit a pulse of peripheral origin, which lends very strong additional support to the experimental observation that the peripheral arteries of the skin are dilated. Brush and Fayerweather found that the blood-pressure in the wrist arteries falls during the first two hours of sleep, and then gradually rises up to the time of waking, and that the maximum intensity of sleep corresponds with the minimum blood-pressure. Shephard, on the other hand, contends that the volume, not only of the peripheral parts, but also of the brain, increases during sleep and decreases on waking. He says there is sometimes a temporary fall of the brain volume preceding the more marked rise which ushers in deeper sleep; that stimuli which disturb, but do not awaken, the subject cause a fall of volume of the brain and peripheral parts; and that changes in brain and periphery are always parallel or very nearly so. According to this observer the cerebral blood-supply does not vary passively with changes in the general blood-pressure, but there is actual constriction and expansion of the cerebral vessels themselves. Thus, while the evidence for the existence of peripheral hyperæmia in sleep is conclusive, some authorities, though a very small minority, refuse to admit that this condition is accompanied by cerebral anæmia.

Internal organs—The internal organs share in the general slowing-down of the body-metabolism, and it is probable they are more or less anæmic on account of the peripheral vaso-dilatation. The degree of activity of the stomach, intestines, and kidneys during sleep bears an obvious relation to the subject's habits. Food-assimilation does not necessarily modify sleep and it may even have a soporific effect. The boa-constrictor manages to sleep well during the arduous process of digestion. The general tendency is for the kidneys to secrete less actively, though this condition is by no means invariable. Secretions in general are diminished in amount, with the exception of sweat, which is more actively secreted during

sleep on account, possibly of the cutaneous hyperæmia. The greater functional activity of the sweat-glands reduces the amount of work to be done by the kidneys.

Temperature—Less heat is produced during sleep, on account of the passivity of the voluntary muscles and the diminished glandular activity, while heat loss is increased by sweat evaporation and the distribution of the blood near the body surface, consequently the temperature may fall from 0.5° to 1.0° F.

Nervous system—Sleep, then, does not entail arrested, nor necessarily even enfeebled, activity on the part of those internal organs already considered, but what is the state of the nervous system, central and peripheral? Preparatory to sleep men and animals attempt to avoid all peripheral stimulation by seeking quiet and seclusion. The impulses which reach the higher centres must be reduced to a minimum, hence light and noise act as disturbing factors. Lombard found that sleep exercised a depressing effect on the knee-jerk, and observed that a dream of active movement was associated with a very violent knee-jerk, a fact which points to a certain amount of cerebral activity making itself felt throughout the body even during sleep. Noyes caused the ligamentum patellæ of a demented patient to be tapped every 5 seconds, and a graphic record showed that during quiet sleep no response was elicited, but that the application of any stimulus, though insufficient to awaken the sleeper, led to the production of a series of kicks. Experiments by Rosenbach in 1881 showed that reflex-excitability is weakened during the initial period of light sleep, while in deeper slumber the abdominal, cremasteric, and tendon reflexes are abolished, though the tickling of sensitive areas of the skin causes response even in the most profound stage. He held that the active contraction of the sphincters during sleep is due to direct cerebral influence, because if sleep were a cerebral paralysis, the spinal reflexes, instead of being weakened, would be increased as in decerebrated animals. Tarchanoff investigated the state of the cerebral cortex, the afferent nerves, and the spinal cord in

sleeping puppies. His results show that the cerebral cortex ceases to react readily to electrical stimulation, which in the waking condition was sufficiently powerful to excite pronounced muscular reactions. Moreover, when the animals were subjected to auditory, luminous, or tactile stimulation flushing of the brain and increase in its volume were observed, clearly indicating the persisting activity of the afferent nerves, even though the impulses conveyed by them were not registered in consciousness. It can be shown, also, that the efferent nerves are able to transmit impulses during sleep. A sleeper may be observed to brush away an irritating fly or to assume a more comfortable position; he may talk and even answer questions. The somnambulist leaves his bed and engages in the most various occupations. Börner tried the experiment of placing a heavy coverlet over the faces of persons in deep sleep; without awaking the sleeper always removed the impediment. Soldiers have frequently been observed to sleep during forced marches, a well-known instance of this occurring during the retreat of Sir John Moore to Corunna. It is evident, therefore, that sleep is not incompatible with activity of the voluntary muscles and their associated nerves, and one must assume, also, that the portion of the brain, whence the motor impulses proceed, functionates when deliberate movements are executed. Tarchanoff divided the spinal cord above the lumbar region in puppies, and, after they had recovered from the operation, compared the effect of electrical stimulation of the hind- and fore-paws during sleep. He found that the reflex movements of the hind-paws, innervated by the portion of the cord caudal to the point of section, were the same as during the waking state, but that the response of the front-paws in nervous connection with the cephalic part of the cord and the brain, was decidedly less, from which he argued that the brain during sleep exerts an inhibitory action on reflex movements. Moreover, the occurrence of dreams can be explained only by the continued activity of those cerebral centres concerned with the reception and storage

of impressions derived from the sensorium. Partial cerebral activity, then, is not incompatible with sleep. The brain is affected by impulses from the special sense organs, although the sleeper is not fully conscious of them and does not awake; in cases where it is exposed through cranial injury its volume is seen to increase during dreams and it may even rise above the level of the edges of the wound. It has been stated that it is the attention and will that sleep; but, if so, how is it possible to explain the ability to awake at a fixed hour, or at some given signal which would otherwise be inadequate to arouse us? Surely this must imply some exercise of attention and will! The activity of consciousness is dependent on a constant stream of sensory and mental impressions, which must attain a certain intensity in order to be registered in consciousness. It seems as if what might be termed the "threshold value of consciousness" were raised during sleep, so that stimuli to be adequate must considerably exceed in strength those which would be effective in the waking condition. Sleep is the resting-time of consciousness, but there are obviously many states of unconsciousness which are not normal sleep—even though some of them are associated with cerebral anæmia; hæmorrhage, extreme cold, anæsthetics, hypnotic suggestion, compression of the carotids, or a blow on the head may produce loss of consciousness, but in so far as this condition is unaccompanied by recuperative changes in the central nervous system it differs from normal sleep.

Intensity of sleep—The measurement of the depth of sleep depends upon the persisting activity of the nerve-paths and their corresponding cerebral centres. The principle of all the methods employed is the determination of the intensity of the stimulation required to arouse the sleeper at different periods during normal sleep. The dropping of a metallic substance on a metal plate from varying heights has been frequently employed for this purpose. The results obtained show that the depth of normal sleep increases during the first and second hours,

and then gradually decreases with more or less regular fluctuations. Moreover, each awakening is followed by an increased intensity of sleep, an effect observed also after a definite weakening of sleep, which stops short of complete awakening. Using an induction coil Howell recorded his own curve of sleep-intensity by measuring the strength of the current necessary to arouse him, and found that the maximum was reached in the first hour or so.

Theories of sleep—Special organ theories—In the endeavour to explain the phenomenon of sleep many and various theories have been propounded from time to time. Some authors have assigned localised causes. It was suggested that the thyroid gland was the organ of sleep on the ground that it acted as a vascular "shunt" for the cerebral circulation, and that it was congested and enlarged during sleep. Osborne credited the arachnoid plexus with being the sleep organ, and stated that during sleep it secreted cerebro-spinal fluid sufficient to produce considerable distension of the ventricles of the brain. Purkinje supposed that cerebral congestion compressed the nerve-bundles, thus interrupting communication between brain and periphery. Increase of knowledge has shown that these theories are untenable. The vaso-motor theory found greater favour for it rested on a more solid basis.

Vaso-motor—Reference has already been made to some of the evidence for the association of cerebral anæmia with sleep, but many additional observations lend confirmation. The scalp covering the anterior fontanelle in young infants is depressed during sleep and elevated during wakefulness. Weir-Mitchell and Hammond, working independently, found that cerebral anæmia precedes sleep, a fact which seems to indicate that it is at least a factor in its causation. It is a common observation that the escape of cerebro-spinal fluid from the ears in cases of fracture of the base of the skull is much greater in the waking hours than during sleep, and such a condition is irreconcilable with the theory of venous

stasis in the brain. Moreover, somnolence is produced by any circumstances which diminish the cerebral blood-supply, *e.g.* the action of heat, excessive hæmorrhage, or the process of digestion. Reference has already been made to Howell's views. He holds that the factors which lead to normal sleep are :—Diminution of irritability, caused by fatigue, of large portions of the cortical area; voluntary withdrawal of sensory and mental stimuli; and cerebral anæmia due to relaxation of tone of the vaso-motor centre and fall of blood pressure. Hill, another supporter of the vaso-motor theory, believes that the regulation of the cerebral blood-flow is effected through the control of the splanchnic, not the peripheral, area.

Chemical theories—Some investigators favoured a chemical explanation of the causation of sleep. The cerebral-asphyxia theory supposes that sleep is due to oxygen deficiency in the brain following on exhaustion of the reserve oxygen of the body, and rests mainly on the fact that oxygen absorption is greater by night than by day. Since less oxygen is required during sleep owing to decreased metabolism it would seem as if some of it were accumulated for utilisation during a more active phase. Preyer holds that sleep is due to the accumulation of fatigue products in the blood, and that these, being easily oxidisable substances, absorb the oxygen required by the brain for its continued activity. He found that the injection of lactic acid, a normal fatigue-product, caused sleep. Pflüger suggested that the formation of CO_2 produced a series of violent oscillations in the surrounding atoms and that these vibrations are necessary for the maintenance of the tissue activity, sleep being the result of a diminution of CO_2 formation in the brain. Professor Errera of Brussels defines sleep as "a physiological intoxication" due to the accumulation of leucomaïnes or poisonous alkaloids in the tissues. He says that work necessarily involves chemical breaking-down, and that the products, including leucomaïnes, are carried by the blood to the brain, where they at length produce sleep. During activity more leucomaïnes are formed by the breaking-

down than oxidation can destroy, but during sleep they are destroyed and carried away. This theory was opposed on the ground that over-fatigue prevents sleep, but Errera urged that the effects of toxic substances vary according to the dose, and while in small doses they can produce sleep, in larger quantities they sometimes cause excitement.

Histological theories.—Some histologists have attributed sleep to the interruption of communication between neighbouring neurons caused by the retraction of their nerve-processes, while others suppose its explanation to be found in the establishment of more extensive mutual relations between the arborisations of the various neurons, with the result that impulses are, as one might say, lost in a labyrinth of nerve-paths and never succeed in reaching the higher centres at all. Ramon y Cajal endowed the neuroglia with amœboid characters in virtue of which it can extend pseudopodia between the nerve elements and interrupt or impede the transmission of impulses.

Consideration of these theories—None of these theories is satisfactory. With regard to the vaso-motor theory one might quote Crichton Browne's remark that "the blood vessels were made for the brain, not the brain for the blood vessels." The advocates of the fatigue-product theory do not explain why sleep can be produced by mere boredom or monotony in the absence of all fatigue; while until the histologists compose some of their own more obvious differences they cannot expect to make many converts.

Loss of sleep—Deprivation of sleep entails far more serious consequences to the organism than does deprivation of food. This was recognised in China, where it was employed as a form of torture and even as a method of capital punishment, and it is difficult to understand how Girondeau in 1886 characterised sleep as "a useless, foolish, and even hurtful habit"! Direct experiments on animals, which have been deprived of food for 20 days and have lost half their weight, show that they may

recover when treated with suitable precautions; while puppies, provided with adequate nourishment, but prevented from sleeping for 4-5 days, died in spite of every care. The puppy deprived of sleep for 3-4 days was in far worse case than one that had passed 10-15 days without food. In starvation the brain and nervous system are the last parts of the organism to suffer, while deprivation of sleep seems to act primarily on the cerebral centres, in which it provokes pathological changes. Patrick and Gilbert in America experimented on three University teachers, who were kept awake continuously for a period of 90 hours. One of the subjects suffered much from sleepiness during the second night, but not nearly so much the third night. He experienced particularly hallucinations of sight, the air seeming full of dancing particles, coloured red, purple, and black, which he tried to catch. He had never had hallucinations before and they disappeared completely on the conclusion of the experiment. All the subjects exhibited an increase in weight, followed by a decrease after sleep. The dynamometer indicated a steady decrease in muscular strength; the reflexes, except in one case, became slower. It is remarkable that the sense of sight grew more acute in all three, but fell below normal after sleep. Memory was very defective and the power of attention exceedingly feeble. Complete restoration was effected by making up about 35 per cent. of the sleep lost, which is possibly accounted for by the greater depth of the resulting slumber.

Pathology.—Pathological changes affecting any organ in the body are associated with either defective or exaggerated functional activity. Insomnia and excessive sleep are the outward and visible signs of inward and pathological conditions.

Insomnia.—Cases of complete insomnia, unless relieved quickly, terminate in death. Patients who assert that they are entirely without sleep are usually suffering merely from insufficient sleep, not absolute insomnia. Sleeplessness results from any cause producing cerebral hyperæmia,

e.g. excessive intellectual labour, anxiety, and various emotional conditions. Undue physical exertion, also, may act in the same way, and is possibly accounted for by the more forcible action of the heart. On the other hand there is experimental evidence to show that extreme cerebral anæmia and great diminution in blood pressure lead to insomnia. Sleep is the resting-time of consciousness and it is interesting to note that the most intractable form of sleeplessness is found in mental disorders characterised by a doubling or division of consciousness. The general fatigue of consciousness is in these cases nearly impossible for it only grows weary and sleeps in part. The insomnia of neurasthenia may possibly arise from a certain lack of unity of consciousness in the victims of this disorder, whose opinions and convictions, sympathies and antipathies, are liable to undergo sudden and frequent changes. Discomfort and physical pain render sleep impossible, for consciousness, played upon by a continuous stream of painful stimuli, cannot rest.

Rational treatment of insomnia—It is doubtful how far artificially induced sleep is really conducive to the restoration of exhausted tissues. A certain antagonism would seem to exist between the action of soporific drugs and of sleep, for otherwise it is hard to explain why the habitual use of such drugs should lead to the loss of the power of normal sleep. In the treatment of mental, just as in that of bodily pain, rest must be obtained, if not by natural then by artificial means. In dealing with persistent insomnia, rational treatment should first be employed, and only when this fails may recourse be had to drugs. Good results frequently follow proper attention to hygienic conditions, baths, cold compresses to the head, electricity and massage to the head, neck and spine, and any modification in diet that may be indicated. Since normal sleep demands cerebral anæmia the patient should avoid all source of excitement during the evening. A light supper may be useful in producing hyperæmia of the digestive organs, but an overburdened stomach tends to produce nightmare. Broadbent recommends the

placing of a hot bottle under the neck and the use of aperients even if the bowels are free. The influence of constipation on the general health, and particularly on the nervous system, has long been common knowledge. Voltaire advised that before asking a favour of a minister "we should adroitly ascertain whether his bowels are acting freely." The influence of monotonous sensations in inducing sleep are referred to by Southey in "The Doctor." "I listened," he says, "to the river and the ticking of my watch: I thought of all the sleepy sounds and of all the soporific things—the flow of water, the humming of bees, the motion of a boat, the waving of a field of corn, the nodding of a mandarin's head on the chimney-piece, a horse in a mill, the opera, Mr. Humdrum's conversations, Mr. Proser's poems, Mr. Laxative's speeches, Mr. Lengthy's sermons. I tried the device of my childhood and fancied that the bed rushed with me round and round. At length Morpheus reminded me of Dr. Torpedo's Divinity Lectures, where the voice, the manner, the matter, even the very atmosphere and the streaming candle-light were all alike soporific; when he, who by a strong effort, lifted up his head and forced open the reluctant eyes, never failed to see all around him asleep. Lettuces, cowslip wine, poppy syrup, mandragora, hop pillows, spider's web pills, and the whole tribe of narcotics, up to bang and the black drop, would have failed—but this was irresistible; and thus, 20 years after date, I found benefit from having attended the course."

Excessive sleep.—A feebly developed consciousness is easily and quickly fatigued, hence those in whom it is found require a great amount of sleep. Children, savages, cretins, and people of inferior intelligence fall asleep as soon as they have no occupation. A similar tendency is observed in some diseases, *e.g.* anæmia and myxœdema. Again diminution of sensibility to exteroceptive impulses entails necessarily some enfeeblement of consciousness. A case is quoted by Strümpell of a youth of 16, blind of one eye and deaf of one ear, who suddenly developed

complete cutaneous anæsthesia. By closing the sound eye and stopping the healthy ear no impressions from without could reach his brain, nor could he furnish sufficient images or ideas from within to maintain consciousness in a state of activity, with the result that he fell into a deep sleep. The tendency to sleep seems to be increased whenever there is a more or less pronounced enfeeblement of consciousness, whether this weakening depends upon abnormal substances circulating in the blood, the cutting off of exteroceptive impulses, or general exhaustion of the organism following disease or malnutrition.

Hibernation—The hibernation of certain animals such as bats, marmots, and hedgehogs presents many features of interest. These animals fall asleep with the advent of cold weather and remain so until the following spring. Their metabolism diminishes greatly, the respiratory exchange and quotient being lowered. The heart's action becomes slower and feebler, and Cheyne-Stokes' breathing frequently occurs. The muscles assume a condition of semi-rigidity; the temperature falls, but always remains higher than that of the surrounding air. At the beginning of hibernation the animal's "fat depôts" are full, for during the winter-sleep it must be self-supporting and live on its own tissues; on awakening it is emaciated and voracious. If the animal be protected from fall of temperature hibernation does not occur. The overpowering and irresistible desire to sleep that afflicts polar explorers and others who are exposed to extreme degrees of cold is notorious. Hibernation, however, is a self-protective mechanism which enables an animal to live through a season when food might be unprocurable with the minimal amount of tissue-waste, while the man who yields to the desire for sleep induced by extreme cold wakes no more. There appears, then, to be nothing in common between the two cases except that cold is the exciting cause. Instances of prolonged sleep in human beings, however, are not uncommon, and develop sometimes in consequence of considerable hæmorrhage,

painful emotions, or excessive fatigue, and sometimes without any discoverable cause. Sleep of this kind may last for days, weeks, or even months without intermission. The patient, as a rule, cannot be roused, and if he is awakened he soon relapses into slumber.

Narcolepsy—During this condition of narcolepsy metabolism is decreased just as in hibernating animals, for the patient can subsist on little or no food or drink, though liquids introduced into the mouth are easily swallowed. Furthermore, a more or less pronounced cataleptic condition is generally associated with narcolepsy, producing a certain degree of muscular rigidity, and increasing the resemblance to the winter-sleep of animals. Blanchet, a French physician, has recorded the case of a lady, aged 24, who slept for 40 days when she was 18 years of age, and 50 days when she was 20, and at length had a sleep of nearly a year, *viz.* from Easter Sunday, 1862, to March, 1863. During this period a front tooth was removed in order to feed her with milk and soup, her only food. She was motionless and insensible. The pulse was low, the breathing scarcely perceptible, there were no evacuations, and she showed no emaciation, her complexion remaining florid and healthy throughout. A state such as this is not a prolongation of healthy natural sleep, but one of hysterical coma, and the victims of the disorder are nearly always of low intellectual development and feeble consciousness, or members of families possessing a history of nervous or mental disease. In another case of narcolepsy a man of 43 died after a sleep of 465 days. This individual slept 4½ years during the last 8 years of his life. He belonged to a family with an hereditary predisposition to mental disease and the autopsy revealed a centre of necrosis in the brain. Massage and electrical treatment are said to have proved beneficial in cases of narcolepsy.

Prolonged sleep may follow very violent emotion. It is recorded that Napoleon after the battle of Aspern, his first defeat after seventeen victories, was overpowered by sleep, and slept 36 hours without waking, a circumstance

which caused his attendants to fear for his life, as he usually slept very little, seldom exceeding 4-5 hours. His powerful consciousness must have been temporarily overcome by the emotion arising from the loss of this battle. Let us hope that an even more prolonged slumber has been enjoyed by the *ex*-All-Highest of Germany! !

Paroxysmal sleep—Besides prolonged pathological sleep briefer lapses of consciousness may occur, known as paroxysmal sleep, and generally considered to be of an epileptic character. This condition ranges in severity from simple drowsiness or actual sleep to various degrees of mental automatism. The subject of this disorder, if talking, may stop short in the middle of a word or sentence for the duration of the attack, and then complete what he was about to say without being aware of any unusual occurrence. This epileptic form of sleep usually lasts for a few minutes, sometimes half an hour or more. It resembles in many respects normal sleep, the extremities being relaxed, pulse and respiration slowed, and sensibility so lowered that no stimulation will arouse the subject. The pupils, however, are usually dilated, not contracted as in normal sleep.

Hypnosis—Hypnosis is a condition produced through an artificial enfeeblement of consciousness by means of monotonous or uniform sensations. Psychologists have shown how speedily monotonous work produces fatigue and it is a common experience that concentrating the attention upon some monotonous sound or uniform sensation tends to induce sleep. Many and various are the devices that have been employed for this purpose. Russian nobles had a habit of soothing themselves to sleep by having their servants scratch their heels. Savage-Landor records that in Korea mothers scrape their infants gently on the abdomen for a similar reason. Rabelais tells a story of some monks who, oppressed with wakefulness, resolutely addressed themselves to prayer, and before they had concluded half a dozen aves or paternosters they all fell asleep. There are people who count in order to send themselves to sleep; others sample

the fatiguing qualities of a Greek verb; children are crooned to sleep by means of monotonous lullabies. The fundamental principle of all these various methods is to fatigue consciousness by monotony. Normal and natural sleep is the outcome of all such procedures as these, for if any hypnotic element is present at the commencement it is only transitory. Prolonged hypnotic sleep is induced also by means of monotonous or uniform sensations, but it differs manifestly from natural sleep, and hence may be considered here as a form of abnormal sleep. Walden in America investigated the condition of the vascular system during hypnosis, and points out that the pronounced and increasing vaso-constriction of the arm, which is shown in plethysmographic records, is the reverse, in general, of the condition observed in natural sleep, which is associated with peripheral dilatation. He draws one general conclusion from his experiments: "Assuming," he says, "as there is good reason for doing, that lessening of mental activity is accompanied by a peripheral dilatation of the blood vessels, particularly perhaps in the skin, and that increased psychical activity is accompanied by the reverse condition of a peripheral constriction, then the remarkable general tendency to a peripheral constriction during hypnotic sleep, except for a variable initial period, would point to a steadily acting mental stimulation during the time that the suggestion is effective."

Somnambulism—Somnambulism is a condition commonest in childhood and youth. In cases of extreme fatigue consciousness may be arrested while muscular action is continued, as *e.g.* the sleeping of soldiers during forced marches. This, however, is merely the continued performance of those actions which were being carried out by the sleeper prior to the onset of sleep, whereas the somnambulist retires to rest, and during sleep arises and executes automatically all sorts of muscular acts without awakening, *i.e.* without consciousness. In this condition the eyes are frequently open and the pupils dilated, so that objects can be perceived with very little light; the sense of touch is usually more acute, though

there may be analgesia; while reaction to auditory stimulation is sometimes observed. Remarkable intellectual feats have been performed by somnambulists, and cases of murder and suicide are on record. There is usually little or no power of recalling events that have occurred in this state, and if anything is remembered it is only as a dream. The phenomenon of double personality has been held by some to be really a manifestation of somnambulism in which all the senses and faculties are active.

HYGIENE.—Finally a few points about the hygiene of sleep claim consideration. How much time should be devoted to sleep? Usually the amount required is in inverse proportion to the strength and development of consciousness. Infants require a great deal of sleep, because a brief period of waking suffices to fatigue their feeble consciousness. With increase of years less sleep becomes necessary until middle age is reached when consciousness is at the zenith of its development. In old age the amount required depends upon the state of preservation of the intellectual powers and varies much in individual cases. The period devoted to sleep by healthy adults is usually 8 hours, but some have been satisfied with much less. Jeremy Taylor is said to have allowed himself only 3 hours out of the 24. Persons of very marked personality and highly developed consciousness seem to require less sleep, their consciousness not being readily fatigued. Napoleon rarely slept more than 4-5 hours. On the other hand Dr. Johnston complained of his tendency to somnolency. Kant, who regarded bed as the nest of diseases, risked the consequences for 7 hours. If consciousness becomes much enfeebled in old age the need for sleep is the same as in young children, but if the intellectual faculties are well preserved there may be a tendency to insomnia, for the aged have a somewhat detached and unimpassioned point of view, and consequently the world, the flesh, and the devil have a diminished power of fatiguing their consciousness.

Excessive sleep—Excessive sleep is injurious at all

ages. Hippocrates stated that it prevents the aliment from being digested and generates crude humours. The vegetative life of the organism tends to be over-developed to the detriment of the central nervous system. Exercise of consciousness is a condition necessary for its development, and enfeeblement must follow unduly prolonged inactivity, just as atrophy is the fate of an unused muscle. Moreover, since excessive sleep entails more or less inactivity of many of the chief organs and tissues of the body, these also will tend to undergo weakening. Therefore an undue tendency to sleep must be combated. Any means of producing a copious flow of blood towards the brain may be employed, *e.g.* pleasant society and amusements, stimulating drinks—like tea and coffee. What a useful institution is the tea which prefaces the proceedings of this Society! Erasmus Darwin records the habit of a friend of his who used to resist overpowering somnolence successfully by dwelling on some grievance, and his righteous anger being roused caused the desired cerebral hyperæmia. It is not improbable, that this gentleman's friends would have preferred him to go to sleep, for he cannot have been a pleasant companion at these times! One writer says of those afflicted with this somnolent tendency:—"We must therefore procure them occupations, in no serious sense of the word, but such as to correspond to the general level of their psychic development. There are persons who find a serious and interesting occupation in observing whether all the clocks strike simultaneously or in a certain order; others occupy themselves with table-turning, playing at Patience, and so on. Such occupations, proportional to the intelligence of each, are necessary to overcome the exaggerated and harmful tendency to sleep."

Position in sleep—The sleeper should lie as nearly horizontal as possible, and he should accustom himself to sleep with equal ease on either side or in the supine position. Dr. Osborne in the Dublin Quarterly Journal of Medical Science in 1859 stated that children up to the age of 14 sleep equally well in any of these positions, but between 14

and 20 a preference is exhibited for the right side. Change of position prevents venous congestion and advantage should be taken of every awakening to vary the attitude, and indeed this is generally done almost unconsciously. Macnish in his "Philosophy of Sleep" quotes a statement by a Dr. Hunter to the effect that women who love their husbands generally lie on the right side, adding "this interesting point I have no means of ascertaining, although, doubtless, the ladies are qualified to speak decidedly on the subject."

Hours of retiring and rising—As regards the hours of retiring and rising, it would probably be beneficial to conform more closely to natural conditions than is habitual among civilised peoples. It is doubtless healthful, provided the hour of retirement be not too late, to rise early in the summer, and it confers a pleasant sense of moral superiority over one's lie-a-bed neighbours, but the "early-to-rise" enthusiasts are not convincing when they acclaim the virtues of the extreme psychic depression consequent on a winter morning's toilet made by the light of a spluttering candle.

ART. VII.—*A Direct Reading Localiser for X-ray Work.*[a]

By EDWARD OSWALD MARKS, M.D. Univ. Dubl.; late Captain, R.A.M.C.

X-RAYS being propagated in straight lines, the position of a shadow thrown by an opaque body must depend on the relative positions of the source of rays, the opaque body, and the receiving surface. If the source of rays is moved the position of the shadow alters according to simple geometrical principles. If by actual measurement we know two positions of the x-ray tube in relation to the fluorescent screen or photographic plate and know the two corresponding positions of the shadow cast by an opaque body, it is a simple geometrical problem to determine the position of the opaque body.

With the exception of such methods as the use of visual

[a] A Thesis read for the Degree of Doctor of Medicine in the University of Dublin on July 3, 1919.

judgment in stereoscopic radiographs, or of radiography in two different planes, approximately at right angles, the above geometrical principle forms the basis of practically all the numerous methods adopted for determining the position in the human tissues of opaque bodies embedded therein.

These methods all, so far as the writer is aware, involve a greater or less number of measurements, and they all require either calculation or reference to tables of figures or some form of slide rule, unless some method of reconstructing the problem is adopted, such as the Mackenzie-Davidson localiser.

In the presence of what seems to be a plethora of efficient devices for applying the one fundamental principle there would appear to be little reason to suggest yet another variation. It is hoped, however, that the following method will be found useful as being equally accurate in practice with those now in use, but possessing the advantage that only the one and final measurement is made—that of the movement of the shadow—and as this is made on a scale reading directly the depth from the skin there is absolutely no calculation or reference to tables of any kind. It will be seen, too, that within the range of the scale the distance of the patient from the screen is immaterial—a fact which considerably simplifies the adjustment and arrangement of the patient and apparatus.

The apparatus necessary is the ordinary x-ray outfit as required for other methods of localising. It must be possible to centre the x-ray tube vertically below the foreign body, and from this initial position to shift the tube accurately through a constant distance. It must be possible also to rest the screen or plate at a constant distance above the tube. While these two distances must be always accurate their actual magnitude need not be known, and may be decided on merely to suit the convenience of working. For instance, the stop arrangement for limiting the movement of the tube in taking negatives for stereoscopic work may be used for determining the constant tube-shift

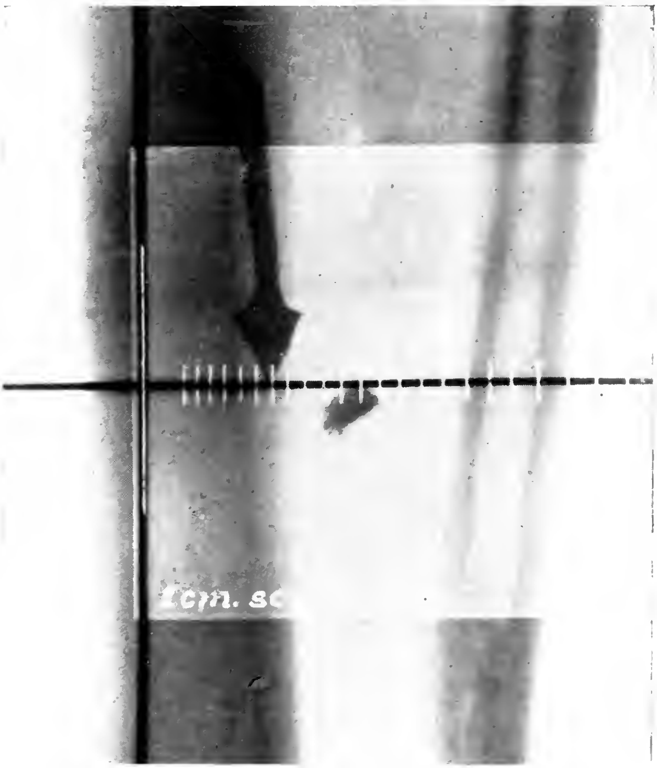
With a constant tube-shift and a constant working dis-

tance it is obvious that the movement of a shadow on the screen will depend on the distance from the screen of the opaque body. By centering the tube under a vertical series of opaque objects—such, for instance, as a ladder of needles at one centimetre intervals—the shadows of the series coincide. On then shifting the tube the shadows are separated and form a scale showing the movement of shadows of bodies at definitely varying distances from the screen. If now at our definite working distance we take two exposures on the one plate—the first with the tube centred under the ladder of needles, the second after the tube has been shifted the definite distance, the resulting negative is an accurate empirical scale which may be copied into more convenient form as desired. A tracing of it in Indian ink on a transparent sheet of celluloid has been found satisfactory in use as well as easy to make quite accurately.

To localise a foreign body in the tissues it is necessary to centre the tube vertically under the foreign body. A metallic skin marker is now placed on the skin, so that its shadow concides with that of the foreign body. The skin marker now, of course, indicates the point on the skin vertically above the foreign body. If it is intended to work with the screen the scale is now placed on the screen so that its zero mark coincides with the shadows of the foreign body and skin marker. The tube is then shifted through the constant shift, and the shadows of the skin marker and foreign body are thrown on to different portions of the scale. At our fixed working distance for which the scale was constructed, the number of scale divisions separating the two shadows is obviously the depth in centimetres of the foreign body from the skin marker. If, as is usually more satisfactory and accurate owing to the greater clearness, it is desired to work with a photographic plate, it is necessary to make two exposures in order to show the initial and the subsequent positions of the shadows, unless the apparatus has a cross wire in contact with the plate when, if the cross wire coincide with the initial shadow position, only the exposure in the second position is necessary. By adjusting the zero of the scale to the initial posi-

Plate XIX.

Dr. Edward Oswald Marks on "*A Direct Reading Localiser for X-ray Work.*"



Skiagram of leg shewing foreign body and skin marker. Printed with scale superimposed.

tion on the negative we can read the number of scale divisions separating the shadows of the skin marker and foreign body.

This has been the only measurement made, and gives us the depth direct without any calculation.

There are by this method one or two obvious sources of error, but these are common to all methods working on the one principle, and are not in any way due to the use of an empirical scale, the accuracy of which depends on the accuracy with which we can fix our two constant working distances—as also, of course, does the skiagram showing the shadow movement of the foreign body. Since these working distances can be fixed mechanically without measurement there is in fact rather less possible source of error than by those methods where the distances are measured, and so subject to a personal equation.

The degree of accuracy really depends on the accuracy with which we can read the position of the shadows on the negative, and this is the same whether we use a scale or calculations to determine the result.

It might be thought that since in the present method the photographic plate is not necessarily close to the skin, and so further from the foreign body than in other methods, the resulting shadows being in consequence less sharp, that they would not be capable of as exact measurement. This, however, does not give rise to any greater inaccuracy, for with increased distance from the plate, though the sharpness of outline is certainly diminished, there is a proportionate increase of shadow movement and lengthening of the scale divisions. Thus the same degree of accuracy is really obtained over any portion of the scale, a degree which depends primarily on the sharpness of focus of the tube, and to a less extent on the magnitude of the tube shift.

A considerable error may, of course, be due to the shape of the foreign body, since the outline of its shadow may vary considerably when the rays come from a different direction. It is very desirable, therefore, to take, if pos-

sible, some definite projecting point on the foreign body for estimation.

While possessing advantages in simplicity of working it is not suggested that this method is suitable except for those cases where the vertical depth from the skin is all that is required, which cases, of course, form the vast majority.

Where, as in injuries to the eye, the position of the foreign body is required in relation to the eye-ball, something more than mere depth from the skin is desired, and other methods must be employed.

For the accompanying skiagram illustrating the method I have to thank the kindness of Dr. E. J. Watson.

PERISCOPE.

LUMBAR PUNCTURE AS AN AID TO THE DIAGNOSIS OF MENINGEAL HÆMORRHAGE.

M. Georges Guillain (*Archives médicales Belges*, 72nd Year, No. 3), gives the clinical histories of 13 cases of simple cranial contusions in which meningeal hæmorrhage occurred and remained unrecognised until its presence was revealed by lumbar puncture. The first patient—a soldier twenty-two years old—fell with his head against a wall. He never lost consciousness, and continued his march. Afterwards he complained of headache; but he had neither an elevation of temperature, nor vomiting, nor constipation; nor was his mind affected. However, the lumbar puncture revealed hæmorrhage. In the seventh case the puncture was followed by the restoration of speech and mentality. The author further draws attention to the obscuration of the symptoms of cerebral injuries which are caused by meningeal hæmorrhage, and of the value of lumbar puncture both as a diagnostic agent and as a therapeutic remedy. The withdrawal of the cerebro-spinal fluid also tends to prevent the formation of a subdural hæmatoma. One case terminated fatally, and the untoward result is ascribed to the use of ether as an anæsthetic in a preliminary search for a cranial fracture. From his experience, M. Guillain recommends that general anæsthetics, especially ether, are unsuitable in cerebral surgery.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

The Principles and Practice of Obstetrics. By JOSEPH B. DE LEE, A.M., M.D., Professor of Obstetrics at the North Western University Medical School, &c. Third Edition. Philadelphia and London: W. B. Saunders Company. 1918. Large 8vo. Pp. 1089, with 949 Illustrations, 187 of them in colours.

THERE is no doubt that this work of De Lee is an up-to-date exposition of Obstetrics. In this, the third edition, the size of the already large tome is increased. It is mentioned in the preface that in the treatment of eclampsia more prominence is given to the conservative methods, but we find on turning to the chapter on this subject that "rapid emptying of the uterus gives the best results." This dictum does not tally with modern statistics.

We do not approve the figure demonstrating expression of the placenta; it appears as if a torn piece of membrane is being delivered with the placenta, which is appearing maternal surface first. Were the placenta to be delivered in the manner illustrated trouble might be expected in the puerperium. While tamponnade of the vagina in the treatment of accidental hæmorrhage is mentioned it is not carefully explained. In a work of this size such an important and successful treatment should not have been omitted. The overdoing of asepsis in midwifery is as baneful in its results as its neglect. We advocate gowns, masks, and caps in the operating theatre, but we look upon their use in the private house as a source of danger, inasmuch as the gowned, capped, inexperienced practitioner thinks he need do but little to keep clean when he is thus attired. The dreadful picture (figure 494) of the patient straining against the doctor who wears a

mask with moustache exposed will, we are convinced, be corrected in the next edition.

There is a very fine bibliography, and the author has been fortunate in securing most of the Continental obstetric literature which was published during the period of the war. The obstetric specialist is fortunate who has "De Lee's Obstetrics" in his library.

Heart: Past and Present. By Edgar Lea, M.D. Vict., M.R.C.P. Lond., Honorary Physician and Physician-in-Charge, Cardiac Department, Ancoats Hospital, Manchester; Assistant Medical Officer, Manchester Royal Infirmary; Late Honorary Research Fellow in Medicine, Victoria University of Manchester. London: Baillière, Tindall & Cox. 1919. Cr. 8vo. Pp. viii. + 300.

The author in his preface describes the present work as being in the nature of an inquiry, and adds that it aims at presenting a case for a more intensive clinical study of the heart. In order to advance in the study of any subject it is important not merely to be acquainted with the conclusions arrived at by previous writers, but also to be familiar with the lines on which they travelled. In consequence the first portion of the book is devoted to a brief historical survey of the gradual building up of our knowledge of cardiac disease from the time of the great Alexandrians to the present day. The relative parts played by anatomists, clinicians, physiologists, pathologists, and chemists are clearly summarised. Part II., which constitutes the main bulk of the book, deals in a philosophical manner with the present state of cardiology. The comparative value in prognosis of subjective symptoms and of objective phenomena is discussed and the difficulty of correlating these is emphasised. Many current ideas—such as the relation regarding cause and effect of such a symptom as dyspnœa and the presence of myocardial weakness—come in for analysis and criticism, while the failure up to the present of the modern methods

of cardiac investigations to lead to much advance in treatment is frequently referred to. The exact value of rest and of exercise respectively in cardiac therapeutics also receives detailed attention, but on the whole when one has finished reading one asks oneself what new ideas one has gained from perusal of this volume. Difficulties are pointed out, careful clinical observations, including statistical study of " results " are inculcated, and a general broader outlook on heart problems is advised, but when all this is admitted one is nevertheless left with a sense of disappointment on the whole.

Clinical Microscopy and Chemistry. By F. A. McJunkin, M.D., Professor of Pathology in the Marquette University School of Medicine. Philadelphia and London : W. B. Saunders. 1919. 8vo. Pp. 470.

This book is on somewhat different lines from other manuals on clinical testing, and is carefully worked out. Throughout its pages emphasis is rightly placed on the relationship between the materials commonly examined by the clinician and the body tissues, *e.g.* in regard to the blood cells, sputum, and urinary sediments. It is not a mere compilation, for the author is a judicious critic and has himself introduced some new processes and novel stains. It is new to us that lozenge-shaped crystals of creatinin have been observed in urine after violent muscular exercise. A comparatively simple test for β-oxybutyric acid is described. It depends upon the oxidation of β-oxybutyric acid to aceto-acetic acid by means of hydrogen peroxide. If fermented urine is strongly lævo-rotatory this substance is probably present. Over 100 pages are devoted to the examination of blood, and numerous clear figures and some beautiful coloured plates adorn the text.

In addition to the sections on blood, sputum, urine, gastric contents, and fæces, nearly 150 pages are allotted to the methods of histological work in a hospital laboratory, and to *post-mortem* technique.

A full index completes a comprehensive and accurate text-book, and very few omissions of modern methods could be pointed out. The book is of real value to all pathologists and clinical teachers.

Shell-Shock and its Lessons. By G. ELLIOT SMITH, M.A., M.D., F.R.C.P., F.R.S., Dean of the Faculty of Medicine and Professor of Anatomy in the University of Manchester, and T. H. PEAR, M.A., B.Sc., Lecturer in Experimental Psychology in the University of Manchester. Manchester: At the University Press. London: Longmans, Green & Co. 1917. Cr. 8vo. Pp. xv. + 135.

THIS little work, the product of two distinguished teachers in the medical school of the University of Manchester, will occasion some heart-searchings amongst those readers who may be responsible for the care and treatment of the mentally afflicted within these islands.

The earnestness of the plea put forward for reformation with regard to the early treatment of those presenting mental symptoms cannot be overlooked and, indeed, it is a more urgent question for the welfare of the nation's future than many other needs that occupy more closely the time of our legislators.

The establishment of psychiatric clinics in this country has already been delayed too long. It is widely recognised that in mental trouble, as in almost every other aberration, early treatment is a very important element in attempting to reach the goal of recovery. Unfortunately our legislative measures affecting the alienated are distinctly hostile towards any skilled treatment for the majority, until such time as when slight symptoms will have passed into marked entities of mental disease—which transition too often spells the word dementia.

In the work before us the nature, development and symptoms of shell-shock are shown in a clear fashion. No classification is attempted; nor perhaps, at this state of our knowledge, would it be desirable.

The treatment found to have been of most utility is

given considerable space and it covers such procedures as isolation, hypnotism, psycho-analysis, and re-education.

The authors lay stress upon the great importance of the individual and personal character of the patients' affliction. They advocate a minute investigation of the origin of each neurosis and symptom thereof—for in this manner alone can precise diagnosis be reached, which may mean the unearthing of the buried complex. We regret the delay which has taken place in noticing this valuable contribution to the medical bibliography of the great war. It, however affords an opportunity to state that with commendable public spirit the publishers, Messrs. Longmans, Green & Company, have quite recently (1919) issued a new and cheap impression of the work, of which the cost is only one shilling and sixpence net.

H.R.C.R.

Crichton Royal Institution, Dumfries. Seventy-ninth Annual Report. Year 1918. Dumfries: The Courier and Herald Press. 1919. Pp. 60.

The report presented by the Resident Medical Superintendent for the year 1918 includes, as usual, many interesting data concerned with the administration of this great institution.

The total number of patients under treatment was 1,190—figures which slightly exceed those for the previous year. Of this number, 152 were voluntary boarders, which constitutes a record for this particular class of patient. Only one of these required certification—his mental condition necessitating this step.

Amongst the admissions, the predominant causative factors, in association with the usual inherited instability, were worry, anxiety and the emotional stresses; these accounted for 48 per cent. of the total and were nearly twice as prevalent amongst the women as compared with the men. A large proportion were the effect of war—directly or indirectly.

It has been previously shown that, so far as the mental

health of the people is concerned, the war has had a beneficiary effect—the criterion being the number of admissions to asylums taken as a body.

Dr. Easterbrook, however, utters some words of warning concerning this question, and points out his belief that, owing to the number of special hospitals established for the treatment of soldiers and sailors, this decrease was in all probability more apparent than real. Further, he believes that the full mental effects of the war have yet to come "when the tension is fully relieved and reaction sets in."

Another matter of interest concerns the proportion of alcoholic cases admitted to the institution. As would be expected alcohol, as a factor of causation, shows a progressive diminution due to the necessary war restrictions upon the output and importation of intoxicating beverages. The author of this report is not a believer in total prohibition and he holds that, should this policy be adopted, it will eventually promote the development of other evils which may, perhaps, be more difficult to combat.

The death-rate of the institution shows a considerable increase, due, no doubt, to the autumnal visitation of influenza which, with pneumonia, accounted for 19 per cent. of the total for the year.

The usual statistics are appended, and in addition there are copious tables and notes upon meteorological observations taken at the climatological station in connection with the hospital.

Anaphylaxis and Anti-Anaphylaxis. By Dr. A. Besredka. English Edition by S. Roodhouse Gloyne, M.D., Leeds; D.P.H., Lond. London: William Heinemann, Ltd. 1919. Demy 8vo. Pp. xiii. + 675.

Dr. Gloyne has excellently fulfilled his aim in translating the spirit and not the letter alone of Dr. Besredka's book. The book gives a clear description of the pnenomena of anaphylaxis, the methods by which they can be produced and the author's theory as to the mechanism of their pro-

duction. Dr. Gloyne in a last chapter describes recent work and theories. The book can be thoroughly recommended to the medical practioner who wants to understand the subject as far as it is possible at present, and to the investigator who wants a summary of our present knowledge and references to the essential literature. W.M.C.

The Blind: their Condition and the Work being done for them in the United States. By HARRY BEST, Ph.D., Author of the Deaf: their Position in Society and the Provision for their Education in the United States. New York: The Macmillan Company. 1919. Demy 8vo. Pp. xxviii. + 763.

BLINDNESS perhaps meets with more general sympathy than any other calamity. Our most beautiful and correct perceptions are derived through the medium of sight; the want therefore of such a medium is an evil for which no other possession can compensate. So wrote Charles Barker in his great monograph in 1830, which was published by the Society for the Diffusion of Useful Knowledge, entitled "Instruction of the Blind." His pamphlet did much to stimulate interests in the condition of the blind, and its beneficent influence brought both monetary and scientific aid to the afflicted; and it stimulated the study of the prophylaxis of the disease and the industrial conditions which cause loss of sight. Dr. Best's book follows the lines of Mr. Charles Barker's writing; but he has overlaid his volume with so many tables of statistics and such a superabundance of reference notes, all of which are printed in ruby type, that again and again the reader leaves down the book wearied with eye-straining notes and too frequent interruption by tables of statistics. With the laudable desire to leave nothing relative to his subject untouched the sequence of the subject is broken, and we get a passing reference to somebody or something, which simply whets and does not satisfy the appetite. However, the 700 odd pages contain an immense amount of trustworthy information; more than sufficient to make the volume a very

useful book of reference; one which has also the advantage of having a good index. The opening chapter deals with general conditions of the blind, and under the term blind he includes those whose "remnant of sight" is of such limited extent as to be of little material service, "and hence to all practical intents such persons are rightly thought of as blind." The following chapter treats of the general attitude of the United States laws towards the blind; and we confess that we think their law in this respect is much inferior to our own. The economic of the afflicted is dealt with in the following 40 pages; and the many and serious disabilities under which they suffer are well and clearly told. All must agree that the only hope of betterment lies in education, as the St. Dunstan's school has shown. But when our best efforts are made for the blind our contribution is poor in comparison to their loss, many poets and novelists have told of their suffering and awakened sympathy for them. But their best friends have been those who undertook as a duty the amelioration of their lot; of these Dr. Best gives a brief but interesting notice in which he refers to the special tax in 1650 of the Colony of Maryland. This is interesting to us, as the tax was carried out during the proprietory of Cecil Calvert, second Lord Rathmore, of the Plantation of the County of Longford, and it was the first authorised taxation in New England for a charitable purpose. Yet for fully 100 years no progress seems to have been made in instructing the blind to read, and we regret to find that the earliest attempts in this direction are not referred to in the book before us. Characters in relief were amongst the earliest methods adopted to teaching; the letters chosen being Slavonian, on account of their square form. Movable letters were afterwards invented, and were made to slide in grooves. It was with similar letters James Ussher, Primate of all Ireland, learned his alphabet from his two aunts, who were both blind. To movable type succeeded pin-cushioned type and the lead type of Pierre Moreau. Soon afterwards Valentine Haüy, brother of René Just,

the distinguished mineralogist, discovered the blind beggar and for his sake invented raised type. This invention and the love shown gained for him the title of "The Father and Apostle of the Blind." The next step forward was the introduction of triangular letters by Mr. James Gall of Edinburgh in 1827, an improvement in which François Joseph Gall had no part. The type was finally modified by being serrated; as being more readily recognised by fingers of blunted sensibility. Matters remained so until the coming of Louis Braille, who became blind from an accident at the age of three. In 1826 he was elected Professor in the Institution now known as l'École Braille à Sainte Marine; he modified Mr. Barbier's six dot letter alphabet, and so produced an alphabet which quickly became a favourite for those for whom it was intended. The work of Haüy and his successors fascinated the public both in Europe and America, and made possible the numerous educational establishments to be found in every civilised country. The legal section of the book, giving as it does, records of cases resulting from defective sight and total blindness are of interest to those concerned as medical witnesses in Employers' Liability and Accident Cases; and especially useful to lawyers. The book well repays careful reading and for purpose of reference is of permanent value.

The Ophthalmoscope. By GUSTAVUS HARTRIDGE, F.R.C.S. Sixth Edition. London: J. and A. Churchill. 1919. Cr. 8vo. Pp. viii+152.

WE can strongly recommend this book to the profession, more especially to that greater part of it which is engaged in general practice.

It should serve as a reminder that the ophthalmoscope is one of the most useful instruments at the disposal of the general practitioner, a fact too often overlooked in this age of specialisation.

The author gives a clear and interesting survey of the instrument and its uses, wisely omitting details, for which

text books on refraction and diseases of the eye can be consulted.

The coloured plates and black and white drawings are excellent, but we feel that the educational value of the book would be considerably enlarged if there were more, especially of the former.

The After-treatment of Wounds and Injuries. By R. C. Elmslie, M.S., F.R.C.S, Brevet-Major, R.A.M.C. (T.F.), Special Military Surgical Hospital, Shepherd's Bush; Surgeon-in-Charge of the Orthopædic, Physical Exercise and Massage Depts., St. Bartholomew's Hospital; Surgeon to Out-Patients, Metropolitan Hospital; Orthopædic Surgeon to Queen Mary's Hospital, Roehampton, &c. London: J. and A. Churchill. 1919. Royal 8vo. Pp. vii. + 323.

This book is thoroughly good. The author has combined the fruits of much experience and of close observation with the result that his conclusions are perfectly sound. The chapters on the treatment of Chronic Osteomyelitis, on the Surgical Treament of Nerves, and on Plaster of Paris Technique, will appeal to all surgeons who have done orthopædic work. The book is well illustrated and indexed. The publishers are to be congratulated on giving the profession a work of such a high standard. H.S.

A Handbook of Medical Jurisprudence and Toxicology for the use of Students and Practitioners. By William A. Brend, M.A., M.D. (Camb.), B.Sc. (Lond.). Third Edition, revised. London: Charles Griffin & Co., Ltd. 1919. Cr. 8vo. Pp. xiii. + 317.

The chief additions to and improvements in this edition are an excellent chapter on the legal relations of insanity and other abnormal states of mind, and a chapter on medical privileges and obligations, which deals with the laws relating to medical practice, and the various matters calling for medico-legal knowledge which are likely to be met with in a practitioner's work.

Military Medical Manuals. Disabilities of the Locomotor Apparatus the result of War Wounds. By AUG. BROCA, Professor of Topographical Anatomy in the Faculty of Medicine at the University of Paris. Translated by J. RENFREW WHITE, M.B., F.R.C.S., Temp. Capt. R.A.M.C. Edited with a preface by MAJOR-GENERAL SIR ROBERT JONES, F.R.C.S., C.B., A.M.S. University of London Press, Ltd. Paris: Masson et cie. 1918. Cr. 8vo. Pp. xix. + 252.

SIR ROBERT JONES has written the following lines in his preface to this book, a more accurate description of it could not be given.

"As in every line of work, skill in the choice of the particular form of treatment which should be applied to any particular case does not come easily and at once, but a careful adherence to the principles enumerated here will enable the surgeon to treat these difficult and frequently disheartening cases on the right lines, and so steer between the two sources of failure—namely, excessive zeal and obstructive temerity."

The author presents some views on the treatment of joints which differ from the usual teaching. Thus he states: "I have never seen a case of ankylosis of the shoulder joint in which correction was at all necessary."

In short this book is not only valuable but also interesting. H.S.

The Ruxmani Hindu Lying-in Hospital, Bombay. Eighth Clinical Report, November 1st, 1917--October 31st, 1918. By DR. M. V. MEHTA. Bombay: Ruston N. Vatchaghandy. Pp. 23.

WE are pleased to see that Doctor Mehta, a Licentiate of the Rotunda Hospital, is following the teaching which he acquired while a student at that institution. He has brought forward an excellent report which is a pattern to all such other institutions in this country as are allowed to receive support and do not publish actual statis-

ties of the work done. With the exception of a table of the caste of the patients the report is modelled on the Rotunda pattern. There were 615 deliveries during the year, and the average mortality was about 1 in 100. We note under this heading that two of the deaths were due to Pernicious Anæmia, two to Pneumonia, two to Malaria, and one to Worms. It is strange to find no case of death from any obstetrical complication. We congratulate Doctor Mehta on his report.

B.S.

The Medical Annual: A Year Book of Treatment and Practitioner's Index. Associate Editors:—CAREY F. COMMIS, M.D. F.R.C.P., A. RENDLE SHORT, M.D., F.R.C.S. Thirty-seventh Year. Bristol: John Wright & Sons, Ltd. 1919. Large 8vo. Pp. cxxviii. + 675.

THERE must be something intrinsically good in an Annual that has reached its thirty-seventh year of issue, and increased in favour with its subscribers. In this instance we may ascribe its success to a judicious selection of matter and the co-operation of a large number of contributions from men of acknowledged repute in Medicine. Further the Annual contains a number of original contributions and is rich in illustrations, some of which are beautifully coloured. The list of contributions contains the names of physicians and surgeons other than Europeans, such as Andrews, of Chicago; Hunt, of New York, &c. Of special interest is the introduction to the volume, in which the Editor draws attention to some of the more important features of this number. The increased price of paper and the rise in wages of all manual workers necessitated an increase in price if the Annual was to be published at its normal high standard of excellence, and the publisher wisely decided to raise the price and continue to give the profession a trustworthy guide of new treatment, one which would be familiar to any practitioner.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, June 14, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ending Saturday, June 14, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 13.9 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ending Saturday, June 14, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 13.9 and 14.7; Dublin Registration Area, 13.4 and 15.0; Dublin City, 13.8 and 16.0; Belfast, 13.5 and 13.5; Cork, 12.9 and 12.1; Londonderry, 15.3 and 19.4; Limerick, 12.2 and 19.3; and Waterford, 28.5 and 18.5.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, June 14, 1919, were equal to an annual rate of 0.3 per 1,000. Among the 104 deaths from all causes in Belfast were 3 from diarrhœa. Among 6 deaths from all causes in Galway was 1 death from enteric fever. The deaths from all causes in Kilkenny include 1 death from whooping-cough.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended June 14, 1919, amounted to 187—101 boys and 86 girls, and the deaths to 110—48 males and 62 females

DEATHS.

The deaths registered, omitting the deaths (numbering 6) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 13.4 per 1,000 of the population. The rate for all deaths registered during the twenty-four weeks of 1919 ended June 14, was 30.1, while in the corresponding period of the preceding ten years, 1909-1918, it had been 24.5.

The 104 deaths appertaining to the Area included 1 from measles, and 1 from diarrhœa and enteritis of a child under 2 years. There were 2 deaths from influenza. In the three preceding weeks deaths from this cause in the Registration Area had numbered 4, 6 and 3, respectively.

Deaths attributed to pneumonia were 8 in number (comprising 2 from broncho-pneumonia, 3 from lobar pneumonia, and 3 from pneumonia, type not distinguished).

Tuberculosis caused 21 deaths as against 22, 31 and 27, respectively, in the three weeks preceding. Of the 21 deaths ascribed to tuberculosis, 19 were referred to pulmonary tuberculosis, and 2 to other forms of tuberculosis.

Nine (9) deaths were caused by cancer, 14 by organic diseases of the heart, and 7 by bronchitis.

Among the deaths of infants under one year old, 2 were due to convulsions, 1 to diarrhœa and enteritis, 1 to congenital malformation, 1 to premature birth, 2 to congenital debility, and 1 to simple meningitis.

Sixteen of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 12 being of infants under one year, of whom 5 were under one month old. Twenty-nine (29) deaths of persons aged 65 and upwards were registered, including 22 deaths of persons of 70 years or upwards.

Of the 104 recorded deaths 49 occurred in hospitals and other public institutions.

There were 2 accidental deaths, of which 1 was due to alcoholic poisoning and 1 to a gunshot wound.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended June 14, 1919, and the cases under treatment at its close, respectively, were as follow:—Enteric fever, 0 and 4; typhus, 0 and 0; measles, 12 and 20; scarlet fever, 8 and 40 (ex-

clusive of 12 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 2 and 16. Nine (9) cases of pneumonia were admitted during the week, and 18 remained under treatment at its close. Of the deaths in hospital recorded during the week, 2 were from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, June 14, 1919, in 96 large English towns (including London, in which the rate was 9.6) was equal to an average annual death-rate of 9.9 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 12.4 per 1,000, the rate for Glasgow being 14.1, and that for Edinburgh 11.5.

METEOROLOGY.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of June, 1919:—

Mean Height of Barometer - - -	30.131 inches
Maximal Height of Barometer (10th, at 9 a.m.)	30.466 ,,
Minimal Height of Barometer (12th, at 9 a.m.)	29.639 ,,
Mean Dry-bulb Temperature - -	56.1°.
Mean Wet-bulb Temperature - -	52.2°.
Mean Dew-point Temperature - -	48.6°.
Mean Elastic Force (Tension) of Aqueous Vapour	0.344 inch
Mean Humidity - - - -	76.5 per cent.
Highest Temperature in Shade (on 11th) -	73.2°.
Lowest (on 3rd and 26th) - - -	45.0°.
Lowest Temperature on Grass (Radiation) (26th)	40.8°.
Mean Amount of Cloud - - -	59.4 per cent.
Rainfall (on 14 days) - - -	3.120 inches
Greatest Daily Rainfall (on 12th) - -	1.813 ,,
General Directions of Wind -	W., W.N.W., S.W.

Remarks.

The weather in June was at first fine, quiet, and summer-like—the mean temperature of the first week (1st-7th) being as high as 60.0°. Conditions became unsettled in the second week. A prolonged thunderstorm occurred on the evening of the 10th, following a summer-like day. On the 12th, a very energetic depression crossed Ireland, causing thunderstorms, a heavy downpour of rain (1.813 inches at Fitzwilliam Square, Dublin), and a gale of wind from N.W.

The latter half of the month was changeable, cloudy, windy and cold, the mean temperature of the fourth week (22nd-28th) falling away to 55.0°. A second heavy fall of rain, amounting to 0.661 inch, took place on the evening and in the night of the 24th. The rainfalls of the 12th and 24th together made up 79 per cent. of the total precipitation in the month, which was 3.120 inches, or 1.170 inches above the average for June.

As in June of the two previous years, bright sunshine was deficient in Ireland.

In Dublin the arithmetical mean temperature (57.3°) was below the average (57.9°) by 0.6°.; the mean dry-bulb readings at 9 a.m. and 9 p.m. were 56.1°. In the fifty years ending with 1916, June was coldest in 1916 (M.T. = 54.1°). It was warmest in 1887 (M.T. = 62.3°), 1896 (M.T. = 61.4°), and 1899 (M.T. = 61.3°). June, 1916, therefore established a record for coldness.

The mean height of the barometer was 30.131 inches, or 0.214 inch above the corrected average value for June—namely, 29.917 inches. The mercury rose to 30.466 inches at 9 a.m. of the 10th, and fell to 29.639 inches at 9 a.m. of the 12th. The observed range of atmospheric pressure was, therefore, 0.827 inch.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 56.1°, or 1.9° above the corresponding M.T. for May, 1919. Using the formula, *Mean Temp.* = *Min.* + (*Max.* − *Min.*) × .465, the value was 56.8°, or 0.6° below the average mean temperature for June, calculated in the same way, in the 35 years, 1881-1915, inclusive (57.4°). The arithmetical mean of the maximal and minimal readings was 57.3°, compared with a 35 years' average of 57.9°. On the 11th the thermometer in the screen rose to 73.2°—wind, N.E. to S.E. (light); on the 3rd and 26th the temperature fell to 45.0°—wind, N.W. to N. The minimum on the grass was 40.8° on the 26th. The mean maximum was 63.9°; the mean minimum was 50.6°; the mean grass minimum was 47.4°.

The rainfall was 3.120 inches on 14 days. The average rainfall for June in the 35 years, 1881-1915, inclusive, was 1.950 inches, and the average number of rain-days was 14. The rainfall, therefore, was much above, and the rain-days were equal to the average. June, 1910, established an undisputed record for excessive rainfall in Dublin—the measurement being 6.211 inches on 19 days. In 1878 the rainfall in June

was also very large—5.058 inches on 19 days; and in 1879, 4.046 inches fell on 24 days. On the other hand, in 1889, only 0.100 inch was measured on 6 days. In 1887 the rainfall was only 0.252 inch, distributed over 5 days. In 1918 it was 0.910 inch on 13 days.

The rainfall in Dublin during the six months ending June 30th amounted to 11.897 inches on 105 days, compared with 9.586 inches on 83 days in 1918, 11.460 inches on 88 days in 1917, 17.011 inches on 123 days in 1916, 18.632 inches on 111 days in 1910, only 6.741 inches on 67 days in 1887, and a 35 years' average of 12.020 inches on 96 days.

High winds were noted on 13 days, and reached gale force (8) on the 12th and 23rd. Thunderstorms occurred on the 10th and 12th. A solar halo was seen on the 29th.

At the Normal Climatological Station in Trinity College, Dublin, the observer, Mr. A. W. Boyce, returns the mean atmospheric pressure as 30.140 inches; highest, 30.458 inches, 9 a.m. of 10th; lowest, 29.630 inches at 9 a.m. of 12th. The arithmetical mean temperature was 57.4°, the mean dry-bulb reading at 9 a.m. and 9 p.m. being also 57.4°. Rainfall, 2.72 inches on 12 days, greatest fall in 24 hours, 1.384 inches on 12th. The number of hours of bright sunshine was 153.4; daily average, 5.1 hours. On the 14th there were 13 hours. At 9 a.m. the mean earth temperature was 58.9° at a depth of one foot, and 55.0° at a depth of four feet. The lowest temperature on the grass (terrestrial radiation) was 34° on 14th and 22nd. The highest temperature in the shade was 77° on 11th; the lowest was 39° on 26th.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, Dundrum Castle, Co. Dublin; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Miss Maude Moore, Blairfinde, Greystones; Dr. J. Denys Hanan,

M.D., Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 2.55 inches, on 18 days. Average, 2.14 inches on 15 days. Maximum in 24 hours, 1.40 inches on 12th. Rainfall since January 1, 12.03 inches on 112 days. Average, 12.62 inches on 93 days. Max. temperature in shade, 71.6° on 4th; min., 40.0° on 3rd.

Malahide.—Rainfall, 1.66 inches on 10 days. Maximum, 0.63 inch on 12th.

Clonee.—Rainfall, 2.34 inches, on 14 days. Maximum, 0.78 inch on 12th. Rainfall since January 1, 14.70 inches on 109 days.

Phœnix Park.—Rainfall, 2.432 inches, on 14 days. Maximum, 1.064 inches on 12th. Bright sunshine, 170.8 hours, including 13.0 hours on 1st.

Cheeverstown.—Rainfall, 2.48 inches, on 11 days. Maximum, 1.00 inch on 12th. Thunder and lightning occurred on the 10th, 11th and 12th.

Donnybrook.—Rainfall, 3.015 inches, on 13 days. Maximum, 1.750 inches on 12th.

Ranelagh.—

Mean corrected Height of Barometer -	30.128 inches
Highest corrected Reading (10th, at 9 a.m.)	30.46 ,,
Lowest corrected Reading (12th, at 9 a.m.)	29.65 ,,
Mean Dry-bulb Temperature - -	56.7°.
Mean Wet-bulb Temperature - -	53.2°.
Mean Vapour Pressure - - -	0.361 inch
Mean Humidity - - - -	79 per cent.
Mean Maximal Temperature - -	65.0°.
Mean Minimal Temperature - -	49.2°.
Arithmetical Mean Temperature - -	57.1°.
Highest Temperature in Screen (11th) -	74.0°.
Lowest Temperature in Screen (14th) -	42.0°.
Lowest Temperature on Grass (14th) -	33.0°.
Nights of Ground Frost - - -	0.
Rainfall (on 14 days) - - -	3.42 inches
Greatest Daily Rainfall (12th) - -	2.08 ,,
Days of Clear Sky - - - -	2.
Days of Overcast Sky - - -	10.
General Directions of Wind - -	W.S.W.-W.N.W.

Remarks.—A fairly favourable month, but somewhat cool, cloudy, and windy after the 11th. The rainfall of the 12th was exceptionally heavy, and there was another heavy fall (0.64 inch) on the 24th. With these exceptions, the month was a dry one.

DUNDRUM.—Rainfall, 2.53 inches, on 16 days. Maximum, 1.75 inches on 12th. Mean shade temperature, 56.6°.; highest, 73° on 11th; lowest, 43° on 25th. Thunderstorms on the 10th and 12th.

KILLINEY (Marino).—Rainfall, 2.61 inches on 10 days. Maximum, 1.56 inches on 12th. On the 24th 0.76 inch was measured.

GREYSTONES (Rathdown House).—Rainfall, 1.91 inches on 21 days. Maximum, 0.97 inch on 12th.

GREYSTONES (Blairfinde).—Rainfall, 1.80 inches on 10 days. Maximum, 1.02 inches on 12th.

NEWCASTLE (Co. Wicklow).—Rainfall, 1.56 inches on 12 days. Maximum, 0.66 inch on 12th. Mean temperature, 55.7°; maximum, 73° on 6th; minimum, 40° on 9th and 10th; mean maximum, 63.9°; mean minimum, 47.5°.

CASTLECONNELL.—Rainfall, 2.79 inches on 10 days. Maximum, 1.27 inches on 11th.

ENNISTYMON.—Rainfall, 2.81 inches on 20 days. Maximum, 0.69 inch on 11th (?)

DUNMANWAY.—Rainfall, 1.01 inches on 11 days. Maximum, 0.28 inch on 18th. No rain fell until the 7th, or from the 12th to the 15th, inclusive; or from the 23rd to the 29th, inclusive. The driest June in about 15 years. First six days were very bright and warm, the rest of the month was very cool, with frequent frosts at night, especially the nights of the 9th, 10th and 21st. Thunder and lightning at 9 p.m. on 10th. There were frequent strong winds from W., N.W., N., and N.E., which, with the night frosts, accentuated the effects of the low rainfall in retarding vegetation. At Dunmanway, June was the driest month in the year, and now holds the position so long held by July.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ *N., Long.* 6° 15′ *W., for the Month of July,* 1919.

Mean Height of Barometer, - - -	30.099 inches.
Maximal Height of Barometer (9th, at 9 p.m.	30.299 ,,
Minimal Height of Barometer (18th, at 9 p.m.),	29.597 ,,
Mean Dry-bulb Temperature, - - -	57.1°.
Mean Wet-bulb Temperature, - - -	53.9°.
Mean Dew-point Temperature, -	50.9°.
Mean Elastic Force (Tension) of Aqueous Vapour.	0.373 inch.
Mean Humidity - - - -	79.7 per cent.
Highest Temperature in Shade (on 31st), -	68.5°.
Lowest Temperature in Shade (on 1st and 13th),	46.3°.
Lowest Temperature on Grass (Radiation) (1st)	42.0°.
Mean Amount of Cloud, - - -	57.1 per cent.
Rainfall (on 11 days), - - -	1.128 inches.
Greatest Daily Rainfall (on 21st), - -	0.454 inch.
General Directions of Wind -	N.W., N.E., N.N.W., W.

Remarks.

July, 1919, was a cool, cloudy, dry month, with a great preponderance of north-westerly and north-easterly winds. This was brought about by the unusual persistence of an area of high atmospheric pressure (anticyclone) on the Atlantic to the westward of Ireland. The arithmetical mean temperature for the month was 57.7°, or 2.7° below the average for July in Dublin during the thirty-five years, 1881–1915. The thermometer never touched 70° in the screen at the Fitzwilliam Square Station, the maximal shade temperature being 68.5° on the 31st. The rainfall was 1.432 inches below the normal and the rain-days were 6 in defect. The bulk of the rainfall occurred on the 4th, 5th, and 21st-22nd, equalling 0.815 inch out of a total of 1.128 inches for the month.

The arithmetical temperature (57.7°) was only 0.4° Fahr. above that of June, and—as has been stated above—fell short of the normal for July in Dublin by 2.7°. The mean dry bulb readings at 9 a.m. and 9 p.m. were 57.1°.

In the fifty-three years ending with 1918, July was coldest in 1879 ("the cold year") (M.T. = 57.2°). It was warmest

in 1905 (M.T. = 63.8°) ; and in 1887 (M.T. = 63.7°). In 1917 the M.T. was 61.4°, and in 1918 it was 59.3°.

The mean height of the barometer was 30.099 inches, or 0.184 inch above the corrected average value for July—namely, 29.915 inches. The mercury rose to 30.299 inches at 9 a.m. of the 9th, and fell to 29.597 inches at 9 p.m. of the 18th. The observed range of atmospheric pressure was, therefore, 0.702 inch.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 57.1°, or 1.0° above the value for June, 1919. Using the formula Mean Temp. = Min. + (Max. — Min.) × .465, the value was 57.3°, or 2.7° below the average mean temperature for July, calculated in the same way, in the thirty-five years, 1881-1915, inclusive (60.0°). The arithmetical mean of the maximal and minimal readings was 57.7°, compared with a thirty-five years' average of 60.4°. On the 31st the thermometer in the screen rose to 68.5°—wind, W.S.W. ; on the 1st and 13th the screened thermometer fell to 46.3—wind, N. and W.N.W. The minimum on the grass was 42.0° on the 1st.

The rainfall was 1.128 inches, distributed over 11 days. The average rainfall for July in the thirty-five years, 1881-1915, inclusive, was 2.560 inches, and the average number of rain days was 17. The rainfall, therefore, and also the rain-days were much below the average. In 1880 the rainfall in July was very large—6.087 inches on 24 days ; in 1915, 5.774 inches fell on 24 days ; in 1896, also, 5.474 inches fell on 18 days. On the other hand, in 1870, only 0.539 inch was measured on 8 days ; in 1869 the fall was only 0.739 inch on 9 days ; and in 1868, 0.741 inch fell on but 5 days. In 1917, 1.855 inches fell on 12 days, and in 1918, 2.758 inches on 18 days.

High winds were noted in Dublin on only 4 days. Temperature never reached 70° in the screen compared with 6 days in 1918, 9 days in both 1917 and 1916, only 1 day in 1915, 21 days in 1911, and 17 in 1905. The thermometer failed to reach 60° on the 4th and 5th.

There was marked "visibility," or clearness of the atmosphere on the afternoon of the 9th. Lightning was seen on the night of the 17th. Sea-fog rolled in over the coast on the

afternoon of the 26th. A solar halo appeared on the forenoon of the 31st.

At the Normal Climatological Station, Trinity College, Dublin, Mr. A. W. Boyce reports that the mean atmospheric pressure was 30.125 inches. The barometer rose to 30.300 inches at 9 p.m. of the 9th, and fell to 29.678 inches at 9 a.m. of the 19th. The mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 58.1°. The arithmetical mean of the daily maximal and minimal temperatures was 37.6°. The screened thermometers rose to 70° on the 31st, and fell to 41° on the 6th. On the 2nd the grass minimum was 36°. Rain fell on 9 days to the amount of 1.03 inches, the greatest fall in 24 hours being 0.42 inch on the 21st. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 164.1 hours, of which 13.0 hours occurred on the 25th. The mean daily sunshine was 5.3 hours. The mean temperature of the soil at 9 a.m. was 59.3° at a depth of 1 foot; at a depth of 4 feet it was 55.8°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, The Castle, Dundrum, Co. Dublin; Mr. W. J. McCabe (for Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Miss Maude Moore, Blairfinde, Greystones; Dr. C. Denys Hanan, M.D., Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 0.66 inch, on 9 days. Average 2.73 inches on 15 days. Maximum in 24 hours, 0.20 inch on 18th. Rainfall since January 1, 12.69 inches on 121 days.

Average, 15.35 inches on 109 days. Max. temperature in shade, 67.9° on 29th; min. 44.0° on 13th.

MALAHIDE.—[No Return].

CLONEE.—Rainfall, 0.94 inch on 11 days. Maximum, 0.41 inch on 21st. Rainfall since January 1, 15.64 inches on 120 days.

PHŒNIX PARK.—Rainfall, 1.125 inches on 10 days. Maximum, 0.414 inch on 21st. Bright sunshine, 185.6 hours, including 14.4 hours on 1st.

CHEEVERSTOWN.—Rainfall, 1.66 inches on 10 days. Maximum, 0.75 inch on 21st.

DONNYBROOK.—Rainfall, 1.040 inches on 8 days. Maximum, 0.500 inch on 21st.

RANELAGH.—

Mean corrected Height of Barometer, - -	30.099 inches.
Highest corrected Reading (9th), - -	30.30 ,,
Lowest corrected Reading, (18th), - -	29.60 ,,
Mean Dry-bulb Temperature, -	57.0°.
Mean Wet-bulb Temperature, - -	54.2°.
Mean Vapour Pressure, - - -	0.383 inch.
Mean Humidity, - - -	82 per cent.
Mean Maximal Temperature, - -	65.0°.
Mean Minimal Temperature, - - -	49.3°.
Arithmetical Mean Temperature, - -	57.2°.
Highest Temperature in Screen (9th, 31st), -	70°.
Lowest Temperature in Screen (30th), -	43°.
Lowest Temperature on Grass (30th), -	35°.
Nights of Ground Frost - - -	0
Rainfall (on 10 days), - - -	1.18 inches.
Greatest Daily Rainfall (20th) - -	0.51 inch.
Mean Amount of Cloud, - - -	62.5 per cent.
Days of Clear Sky - - - -	2
Days of Overcast Sky, - - -	9
General Directions of Wind, - - -	N.E., N.W.

Remarks.—A dry month, but somewhat cool and cloudy.

DUNDRUM.—Rainfall, 1.55 inches on 10 days. Maximum, 0.71 inch on 21st. Mean shade temperature, 57.4°; highest, 71°, on 26th and 30th; lowest, 46° on 28th.

KILLINEY.—Rainfall, 1.21 inches on 7 days. Maximum, 0.65 inch on 21st. Average (24 years), 2.408 inches on 15 days.

GREYSTONES.—(RATHDOWN HOUSE).—Rainfall, 0.99 inch on only 6 days. Maximum, 0.56 inch on 21st. Sea fog on 26th and 27th.

GREYSTONES (BLAIRFINDE).—Rainfall, 0.74 inch on 5 days. Maximum, 0.30 inch on 21st.

NEWCASTLE, CO. WICKLOW.—Rainfall, 0.80 inch, on 6 days. Maximum, 0.31 inch on 21st. Mean temperature, 57.4°, maximum, 74° on 31st; minimum, 44° on 28th; mean maximum, 65.1°; mean minimum, 49.7°.

ENNISTYMON.—Rainfall, 2.14 inches on 12 days. Maximum, 0.51 inch on 4th.

CASTLECONNELL.—Rainfall, 1.52 inches on 11 days. Maximum, 0.33 inch on 18th.

DUNMANWAY.—Rainfall, 1.36 inches on 8 days. Maximum, 0.64 inch on 18th. No rain fell from the 6th to the 17th, inclusive, or from the 23rd to the 30th, inclusive. There were thunderstorms on the afternoons of the 3rd, 4th, and 5th. July was a warm month, especially at the close; but the mornings and nights were often cold.

PERISCOPE.

A THERMOMETER IN THE RECTUM.

A MAN, sixty years old, suffering from tuberculosis and an attack of influenza, was under the care of M. Ed Schwartz in consequence of the following accident, reported by him to the Surgical Society on the 14th May, 1919, as having occurred in the practice of a Cochin physician. The patient's temperature was taken in the rectum, and by some means the instrument was drawn up into the bowel. M. Schwartz dilated the anus, and carefully, but unsuccessfully, sought for the thermometer. A radiograph showed the thermometer to be in the vicinity of the sigmoid flexure. An enterotomy was performed, and the thermometer recovered. Unfortunately, the patient succumbed to the influenza; but the autopsy showed that the sutured intestine was securely sutured, and there was no trace of peritonitis. M. Raudet, in a similar case, was able to successfully remove a thermometer from the rectum, and expressed surprise that the accident did not occur more often.—*Journal de Médecine de Bordeaux*. No. 13. 90th Year.

THE PHYSIOTHERAPEUTIC TREATMENT OF TRAUMATIC INJURY OF THE PERIPHERAL NERVES.

Dr. Léon Stouffs (*Archives médicales Belges*, 72nd Year, No. 3), in a long article, advocates that in all cases of paralysis from trauma of the peripheral nerves three factors are to be considered: the injured nerve, the paralysed muscle, and the psycho-motor centres of the cerebrum. The rational therapeusis consists in the re-establishment of the physiological function of the affected nerve, in the renewal or improvement of the contractility and nutrition, and in re-quickening the psycho-motor action of the nervous centre. For the re-establishment of the conductivity of the nerve many cases are remedied by surgical operation; where this is unsuited, massage, electricity, active and passive movement, and warm air and water baths. And in some cases medical ionisation. Paralysed muscles are treated by warm air and water, massage, gymnastic exercises for the healthy muscles, and active and passive movements. But the principal agent is electricity, which is the chief remedy for the prevention of degeneration of tissues cut off from the nerve centres. M. Stouffs is impressed with the beneficial action of the galvanic current, which he credits with a physico-chemical action which accelerates and facilitates osmotic intercellular changes. As might be expected, the psycho-motor paralyses are the most difficult cases; the long period which sometimes passes before treatment can be commenced, the mental habetude which too often results, are unfavourable conditions to overcome. But by educating muscle by muscle, by inspiring hope, by daily patient and unremitting care the control of paralysed limbs has been recovered, and the brain has been aroused from its torpor.

NEW PREPARATION.

SANATOGEN CHOCOLATE.

Sanatogen Chocolate consists of Pascall's pure chocolate, containing a percentage of genuine Sanatogen. The manufacturers are the Genatosan Company, Limited, of 12 Chenies Street, London, W.C. 1, the British purchasers of the Sanatogen Company. It is claimed, and with justice, that this preparation is attractive in flavour, and free from "muddiness," also that the high food-value of the chocolate and its body-building and sustaining powers are appreciably increased by the addition of Sanatogen, though, naturally, the latter is not present in amounts large enough to be equivalent to the usual dosage of Sanatogen.

In Memoriam.

RICHARD DANCER PUREFOY,
M.D., LL.D. (*Honoris Causâ*), UNIV. DUBLIN;

FELLOW AND LATE PRESIDENT, R.C.S.I.; EX-MASTER OF THE ROTUNDA HOSPITAL, DUBLIN; M.R.I.A.

WITH deep regret it becomes our painful duty to report the death, on the night of Friday, June 27th, 1919, at his residence, 62 Merrion Square, Dublin, of this well-known, able, and highly respected member of the Medical Profession.

RICHARD DANCER PUREFOY was born on the 4th of August, 1847, at Cloughjordan, Co. Tipperary. He was a son of the late Dr. Thomas Purefoy, of Lucan, Co. Dublin, who had married a daughter of Thomas Dancer, of Hilton, Co. Tipperary. His paternal ancestors had come to Ireland in the year 1620 from Fenny Drayton, Norfolkshire, and had settled at Woodfield, Co. Galway.

The school-days of the subject of this memoir were spent for a time at Bective College, and afterwards at Raphoe Royal School. From the latter he entered Trinity College, Dublin, graduating with Honours in the University of Dublin in the autumn of 1871, when he won a Junior Moderatorship in Natural Science along with his class-fellow, friend, and subsequent colleague, William Josiah Smyly, now Sir William Smyly.

Meanwhile RICHARD PUREFOY was pursuing his medical studies with assiduity and success, and in 1871 he obtained the License in Medicine and Surgery of the University of Dublin, graduating in Arts, Medicine and Surgery early in the following year. In 1875 he took the License or "Letters Testimonial" of the Royal College of Surgeons in Ireland, proceeding to the Fellowship of that College in 1879. It was not till 1892 that he became a Doctor of Medicine of his Alma Mater, which twenty years after conferred upon him the degree

of LL.D. *Honoris Causâ*, on the auspicious occasion of the Bi-centenary celebration of the School of Physic of Trinity College, he being at the time President of the Royal College of Surgeons in Ireland.

Long before this date PUREFOY had made his mark in professional circles in Dublin, and especially in the domain of obstetrics and gynæcology. He began his professional life as House Surgeon in St. Mark's Ophthalmic Hospital, serving as such for two years. He then became Assistant Master of the Coombe Lying-in-Hospital, passing thence to the like important position at the Rotunda Lying-in-Hospital. In 1879 he was chosen to be Lecturer in Materia Medica at the Ledwich School of Medicine, in Peter Street, Dublin. For 21 years he acted as Obstetric Surgeon to the adjoining Adelaide Hospital. Such were his early appointments from the clinical side.

With such a record it was not surprising that, in 1896, DR. PUREFOY was unanimously elected Master of the Rotunda Hospital—the appointment in the United Kingdom most coveted by obstetricians. During his tenure of office, which drew to a close in 1903, his reputation as a gynæcologist attracted students from all parts of the world. While Master of the Rotunda he organised the Lucina Bazaar—a highly successful *fête*, which freed the hospital from debt. A well-equipped Pathological Laboratory was among his gifts to the Hospital. A bronze bust, by Oliver Shepherd, presented to him by the Nursing Staff, stands in the fine Entrance Hall.

In 1912 DR. PUREFOY became President of the Royal College of Surgeons in Ireland, and occupied the Chair with great distinction and dignity until 1914. In the following year he succeeded Dr. Walter George Smith as President of the Royal Academy of Medicine in Ireland. He took the keenest interest in the Academy, was hardly ever absent from the Council meetings during his three years' Presidency, and contributed many papers of sterling value to the Section of Ob-

stetrics. Nor was he forgetful of the claims of hospitality on the Chair, both in private and in public. In his third year of office he invited a large and representative company to meet His Excellency the Lord Lieutenant of Ireland at dinner in the Halls of the Royal College of Surgeons.

So far as to his professional life and standing. But Richard Purefoy had many tastes and social interests apart from Medicine. Gifted by Nature with a fine bass voice and a passionate love for music, he often delighted his friends by placing his musical talents at their disposal. He was elected President of the Hibernian Catch Club so recently as last December. He was an ardent Freemason and a member of the Order of the Friendly Brothers of St. Patrick. A lover of Art, he gathered together a fine collection of quaint old furniture and glass, coloured prints and water colours, and other articles of vertu.

Richard Purefoy was a man of characteristic personality, who held to his views even in the teeth of strong opposition on occasion. But all respected him because of his transparent sincerity He was generous and liberal to a fault, and possessed a deep well of sympathy with those in trouble or in sickness. A loyal member of the Church of Ireland, he took a leading part in its activities. One who knew him well wrote the following words, with which this brief memoir may well conclude:

"He did not talk of religion, but no one could know him without perceiving that it was the foundation on which his life and character were built."

J. W. M.

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PART I.

ORIGINAL COMMUNICATIONS.

ART. VIII.—*The Importance of Relativity between Physiological Facts.* By EDWIN WOOTON.

IN the entire domain of human physiology no truth is more firmly established than that the body is never in a static condition at any time between birth and old age. This is true not only of the biochemical and histological activities, but also of those that may be conveniently styled macroscopic.

Our limited powers of sensory cognition unfit us for seeing the differences made by a day; we may not even see those effected in a month; but there is in each human subject a period, be it of many weeks or months, when differences are obvious. Transition characterises the human organism in every moment of life. Commonsense tells us that whatever we can discern sensorily of such change is a summation of stages that are individually unrecognisable. If we walk a mile, our journey will be made up of many millimetres, but at no stage of it shall we detect the addition of any one millimetre. The illustration may be helpful, although the cases are not parallel,

because in life's journey the vital changes are not in the road—they are in the traveller.

Amongst those persons who write of children from the biological side two errors are very common. The one is—regarding the child as if it were a miniature but weakling adult; the other is dealing with the child as an organism whose activities are totally distinct from those of the adult.

Perhaps no other fact that I could adduce would more justify the stress I have laid on the law of transition than does the occurrence of these two mistakes.

At no one period of life does a study of the body afford a conclusive knowledge of its life-long physiology, or even that of the physiology obtaining in the period itself. To understand the laws of life at any one period one must study them at all periods. Organs and parts differ so structurally in infancy from those of adult life, and these again from the organs and parts of old age, and functioning is so modified by advance of years, that he who formed his opinions from a study of the body at one only of these periods would find himself deeply in error.

All biological activities, even when seemingly identical, are transitional. They come from, and are antecedent, to others; and of each we should know the entire history.

Facts have relativity in regard to—(1) others that are congeneric, and sequential; (2) others that are sequential, but not congeneric; and (3) others that are neither congeneric nor sequential, but collateral.

We find congeneric relative facts in such a division of the science as digestion. We find sequential relative facts in assimilation, when considered in connection with digestion. And we find collateral facts in the influence of assimilation upon organic integrity, and that of organic integrity upon digestion and assimilation.

Congeneric relativity is well dealt with in standard works. Collateral relativity is not. Too frequently a text-book appears to have been penned on the assumption that the labours of the organism are carried on as a sequence of sharply defined units, like the stages in the production of a boot. That is not the case in Nature.

The text-book divisions are convenient, but they are artificial. The body is not only digesting, assimilating, secreting, and doing other such things sequentially: it is doing them all at one moment, and many of these processes are inter-acting.

The inter-action is often obscure, but only by showing all that we know of it can we present natural physiology to the student. The opposite gives an academic, diagrammatic impression, as unlike the truth as a black and white portrait is unlike the living face.

We have an immense mass of physiological data—such a huge mass that he must have a good memory who can retain a tithe of them. Yet it is indubitable that the greater number of such facts are not utilised to their full value. In some cases the relations they bear to other data have not been established; and in other cases, where such relations are known and shown, it is only with regard to data that are congeneric and sequential.

Isolated facts may be of interest, and they may have utility; but their isolation discounts them. The potential importance of a truth goes very far beyond the obvious.

There is no more useful branch of literary work than that of bibliography. It is the art of "boiling down" into an epitome or abstract, a book, or an article. An abstract is not an excerpt. The latter is an extract—a passage taken from the matter dealt with. An abstract is the essence of the entire matter.

Some very brilliant text-books pass through my hands from time to time. Yet I can recall the titles of very few which attempt to link up the major facts of the science into a whole, so giving the advanced student a clear and comprehensive view of the complete science.

The student goes out on the sea of cytology, and then on the vasty deeps of neurology, digestion, and the like; but when his voyages are over he has only a confused notion of the world he set out to explore.

Even in the best text-books the general view is frequently "conspicuous by its absence." Yet the limitations of memory are such that for physiology to be a *vade mecum* science it must be finally presented in a form

bordering on the synoptical. And what is true of a volume is equally so of a section or chapter; its teaching should be focussed into a few sentences.

More, for the work of the investigator to have the maximum of practical utility it must ultimately be concentrated. The world of science needs the *product* ten thousand times more than it needs a description of the many stages through which it has passed.

Wading through the contents of a typical advanced work is not altogether unlike travelling in an express, and attempting to view the scenery. One has in each case a series of cognitions, and the greater number fade away.

And the inutility of the thing is glaring. One may read through a volume on digestion and assimilation, poring over the formulæ of hypoxanthins, and oxidases, and what not, without acquiring ability to write a clear history of the intra-bodily disposal of the solid and liquid foodstuffs and condiments that make up an ordinary dinner.

Those acquainted with the medical literature of the 18th century and that of the first half of the 19th century know how fiercely polemics raged between men almost equally ill-informed. In those days medical literature was a sort of tilting ground. Dr. Aybee found that tincture of door-knockers was excellent for "convolvulitis." Whereupon Dr. Ceedee came forward with the positive assertion that the disorder named was *caused* by door-knockers, and could be cured only by extract of bell-handles. And he was followed by Dr. Effgee, who said, with lofty disdain, that there was no such disease as "convolvulitis." It was merely a symptom of something else, with a longer name.

If this reads farcically, not less farcically do the eloquent diatribes of the past read in the light of modern research. There was too much gas and too little light. We can say in all kindliness that clever men reasoned skilfully on faulty premisses.

The tendency now, at least in physiology, is to the opposite extreme. We are in danger of losing our view of truth as an ordinate whole by studying its components exclusively. To use metaphor—we are accumulating building materials and are not fitting them together.

I have no desire to see the science shelves of our libraries weighted with wild speculations, put forward as proved facts. Speculative work has its mission—to suggest lines of research. When it poses as truth it is scientific snobbery.

It is not so much for the speculative work of the writer for which I ask; rather is it for the coldly rational synthesis of proved facts : the honest putting together of the pieces of the puzzle, and the equally honest leaving of gaps where the pieces do not fit.

Some facts proved, or as yet to be found, appear to me deserving of close attention, inasmuch as they promise, if their inter-relations can be shown, to serve as aids in exhibiting the general biological schema of the body.

One is blood-pressure. We can find volumes dealing with multitudes of experiments. They are of little use to the general physiologist. He needs the very essence of many such volumes. He needs to have formulated in the most succinct manner the relation of blood-pressure to infancy, adult life, old age, pregnancy, sleep, foodstuffs, and vessel calibre. He should be told its relation to urea, nutrition, and longevity. I cite only a few of the many particulars needed. There are many others equally important.

Urea is a subject of no less gravity. Surely it is practicable to give in tabular form its quantitative estimation at the various periods of life, and under the varying conditions of climate and diet. The proportionate weights of urea, liver, and body in both the child and the adult are also obviously vital points.

Growth is usually a slurred chapter. Yet for the completion of any work professing to set forth even the elements of the science all obtainable facts relative to increase not merely in body length and body girth, but in the measurements of component structures, should be included.

Again, there is the question of mineral ingesta in relation to the child *in utero*, the mother, the infant, the young child, the adult, and the aged.

These subjects are but exemplary. Some of the data are quite commonplace. Others have not been exactly determined. All are ascertainable, but as detached facts

they have little value. That increases immensely as the field of their influence is widened by linking them up with others to which they are causally related. The isolated facts are like the parts of a watch upon the maker's bench. When their true relationships are seen, they are like the same parts that have been put together as a timepiece.

I may illustrate by an example how vitally important to the science it is that the true position of any fact relative to other facts having a natural tangency to it should be made clear :—

THE CHILD	THE ADULT
Weight at birth (say) 7lbs. = 3161 grammes	Weight (say) 140 lbs. = 63220 grammes
Weight of liver = 4.9 ounces = 139½ grammes	Liver Weight=60 ounces=1700.97 grammes
Daily urea* = 3 grammes	Daily urea = 33 grammes
Ratio of urea per kilo of body weight = 1 gramme	Ratio of urea per kilo body weight = .52 gr.
Ratio of liver weight to body weight = 1 to 22.8	Ratio of liver weight to body Weight = 1 to 37.3
Ratio of daily urea to liver weight = 1 to 46½	Ratio of daily urea to liver weight = 1 to 51.5

CHILD COMPARED WITH ADULT :—

Body weight = as 1 to 20
Liver weight = as 1 to 12.2
Urea weight = as 1 to 11

One need not quibble about the figures. They hit the target round about the bull's-eye; and they show us in succinct form the immense importance of the liver as a destructor organ; and they suggest the possibility of its lessened ratio to body weight in adult life being largely responsible for metabolic impairment.

There are other questions of relativity equally vital. We do not need flabby platitudes as to the moral advantages of the life marital or the life celibate. What we do want set forth is the law of God with regard to the bearing on general organic integrity of continence and sexual functioning. We want weights, measurements, and other quantities. Such questions should not be left to empirics and sentimentalists.

And I think we can carry this doctrine of relativity a good deal further—into the domain of morphology. I am not at all sure that a physiologist would find himself in accord with an artist as to the measurements that constitute an ideal form. The man of science would insist on biological inoffensiveness as a pass test. To him a narrow or shallow chest, narrow hips, or constricted waist would spell bad functioning. But this apart, and granting that the completed statue of the Venus de Milo has proportions acceptable to art and science, it is for the physiologist to say to what extent the proportions of the child can be estimated from those of the adult. Bodily parts do not present a common rate of enlargement in the journey from infancy to maturity. The pudenda develop so rapidly in the earliest years of life that there is little difference between their size and that found in late youth. The mammæ, on the other hand, are rudimentary until puberty, when they make a sudden increase in growth.

The popular parental mind, and the mind-criminal have made some tragic mistakes, based on false judgment of a child's structure, and this, in turn, upon an ignorant assumption that the viewable development indicates receptive capacity. Neither the lay parent nor the criminal has learnt the truth—that pudendal development is no indication of sexual structural fitness.

No physiologist or medical man dare write in a lay journal or teach from the platform truths that if known widely would prevent men from going to the convict cell and the gallows, and would help to guard inviolate the sanctity of childhood.

Works on Forensic Medicine are, as a rule, the only guide that judges and magistrates have on such questions as this. But very few of such books are sufficiently explicit. They should point out the elementary facts, that in infancy the vulval floor is chiefly an impenetrable bed of fatty and cellular tissue; that the vagina is so small as almost to escape notice at a cursory glance; that the vulval floor is much further from the exterior than in the adult; that it is surrounded by walls composed of the labia,

greater and lesser, and the fourchette, and that the effect is to simulate a vaginal aperture.

I am not familiar with even an article which sets forth how far one may judge of a child's pelvic measurements from exterior landmarks. Yet there are such landmarks. The hip measurements, the vulval angle, and the curve of the coccyx are fairly reliable indications of the ratios borne by the parts of the pelvis. And when I have seen my suspicions of future unfitness for maternity borne out by facts I have marvelled at that phase of mentality which hurries a child to the dentist for a toothache, and to the optician or the oculist for some slight defect of vision, and treats as negligible the anatomy of structures on whose fitness for the exigencies of maternity will depend the life of the child and that of her offspring.

The angle of the pelvis is always estimated by the angle of the inlet. The normal and best angle is one of sixty degrees. If the angle is greater than this, the passages are narrowed in some of their diameters; if it be less, the pubis is too high to afford support to the abdominal contents; and various feminine sexual ills result.

The inlet being heart-shaped, its greatest transverse measurement is in its centre, and its least near the pubis. If the angle is great, the pubis is low, and the shorter must be the horizontal measurement from front to back. This shortening has for result the fact that when in life the organs and parts are packed within the pelvis, the child's head cannot at its birth engage the greatest transverse measurement; it is thrust forward, near the narrowest part of the inlet. Putting the matter very plainly: an angle of sixty degrees gives a maximum of packing space and a maximum of passage space.

From a consideration of what has been said it will be plain that there are two distinct abnormal states embraced under the term "narrowness of inlet." The one is a deficient fixed measurement from side to side of the inlet; the other is a factitious narrowness caused by the angle at which the pelvis is set, and is knowable by the lowness of the pubis. The terms "low" and "high" pubis do not indicate any difference in pelvic shape. They result

merely from the pelvic angle. In any variation of this angle the pubis moves (theoretically) in a curve, as if the sacrum were hinged on the spinal column. When the pubis is high, it is somewhat nearer the navel; when low, it is nearer to the coccyx.

The terms high and low are always vague; and so, having once determined the pubic position, a symbol becomes desirable; one by which we may recall the pubic situation without further examination. We find this in the vulval angle, which is estimated in relation to the plane of the abdomen. The value of the vulval angle is in the fact that normally there is a relationship between the lower border of the pubis and the point where the anterior labial separation begins. A horizontal line beginning at this point and drawn through the body from front to back touches the lower pubic border.

To find the vulval angle, place the subject in the erect position, with the hips on a level with the investigator's eyes, and the body so turned as to present side-front. Draw on paper an outline sketch of the abdomen and vulval arc. Draw a straight perpendicular line in front of and touching the abdomen. Unite the extremities of the vulval arc by a chord. Bisect the arc at right angles to the chord, and continue the line of bisection until, if ever, it cuts the perpendicular line. The nearer the two lines are to forming a right angle the higher is the pubis; the nearer they approach the parallel, the lower is the pubis. An angle of forty-five to fifty degrees is fair.

ART. IX.—*The Ductless Glands.*[a] By CAPTAIN GEORGE HALL DAVIS, B.A., Dublin University.

WHAT is a gland?—" A gland is a structure made up of one or more cells of a special epithelial character, which forms a product, the secretion of which is discharged on an epithelial surface or mucous membrane."

The definite structure of glands was early recognised, and they have been described by many of the ancient

[a] Read before the Dublin University Biological Association in the Session of 1918-1919.

anatomists. One of the most characteristic features of glands appeared to be the possession of ducts, and the ancients were greatly puzzled by the fact that certain organs obviously of a glandular nature possessed *no* ducts. Much energy seems to have been expended in futile search for the ducts of these glands. And most of the anatomists, until the beginning of the 16th century, seem to have been of the opinion that these organs *should* possess ducts, and that their failure to discover them might possibly be due to faulty methods of research. However, towards the end of the 17th century it began to be realised that certain glandular organs did not possess ducts, but it was not until 1776 that these organs were first classified as ductless glands.

It is easy to be wise after the event, nor does one require the pluck of a Hilaire Belloc to make suggestions after reading past history, and, therefore, it may seem to us that once the above facts were ascertained the arrival at the discovery of the secreting mechanism of these ductless organs should have been simple and rapid. Here were organs obviously glandular in nature, and resembling other known secreting organs, therefore it was likely that they produced a secretion. As they possessed no ducts to carry away the secretion, it must either be used in the organ itself or passed out of the organ by the only two possible channels—the blood or the lymph.

This possibility does not seem to have been considered, and the earlier theories concerning these bodies were rather fantastic.

The pituitary body receives its name from the earliest theory concerning its function. This gland was supposed to form the secretion of the mucous membrane of the nose, or pituita. This view was held by Galen and Vesalius, while Vieussens and Sylvius considered that the body had to do with the formation of the cerebro-spinal fluid. These two views are of interest from the fact that certain modern physiologists believe that, under certain conditions, a substance from the gland may enter the nose, and also that the pituitary body does add something to the cerebro-spinal fluid. Majendie regarded the pituitary as a kind of

lymphatic gland, which collects the cerebral lymph and passes it into the circulation. Later, the gland seems to have been looked upon by most as a vestigial structure, and it was not until the dawn of the theory of internal secretion that views according with those at present held began to be elaborated.

The pineal body was known to Galen. Descartes, in 1649, formulated a theory in which he ascribed to it the important function of being the seat of the soul—chiefly, it is to be supposed, owing to its central position in the cranial cavity.

Certain medical historians claim that the adrenals were known to the ancient Hebrews, but it was not until 1563 that the first clear account of these glands, with illustrations, was published by Eustachius. For a long time the discovery was unnoticed, and Vesalius, Fallopius, and Fabricius, writing more than a century later, make no reference to these organs. Before the end of the 16th century they began to be referred to as the renal capsules of Eustachius.

In the year 1716 the Academy of Science at Bordeaux offered as the subject for a prize essay: "What is the use of the adrenal glands?" The essays were judged by Montesquieu, the author of "L'Ésprit des Lois," and his report gives an excellent critical account of the older views concerning these bodies, and also discusses the theories put forward by the essayists. The older views are:—

1. That the suprarenals serve to hold up the stomach and strengthen the nervous plexus which touches them.
2. That black bile is preserved within their cavity.
3. That they collect the humidities which leak out of the great vessels in the neighbourhood.

Montesquieu, in criticising the essayist, says:—"We have found one author who declares that there are two kinds of bile. One grosser, which is separated out in the liver, and the other more subtle, secreted in the kidneys by the assistance of a ferment which flows from the supra-

renals by ducts of which at present we are ignorant, and of which," adds Montesquieu, "we are menaced with perpetual ignorance.

"Another essayist describes to us two small canals which carry the liquids from the cavity of the capsule into the vein belonging to it. This humour, which many experiments lead us to consider alkaline, serves to give fluidity to the blood returning from the kidneys after it has been deprived of its serosity in the formation of urine. Another essayist, who gives a difference between conglobate and conglomerate glands, has placed the suprarenals among the conglobate. In his opinion they are nothing but a continuity of blood-vessels within which, just as in filters, the blood becomes more subtle. In these glands, as in all conglobate glands, there is no secretory duct, for there is no question of the secretion of liquids, but only of making them more subtle."

In conclusion, Montesquieu announces that the Academy will not award its prize this year, since the object of the offer has not been achieved. He ventures the opinion: "Perhaps some day chance will give what all these labours could not achieve;" but he is polite enough to state, "but these ineffective efforts are more often an evidence of the obscurity of the subject than a proof of the barrenness of the investigators."

The thyroid gland seems to have been known to Galen, who states: "Now the neck has two glands, in which moisture is generated, but from the two glands that are in the neck there come forth no vessels by which the moisture may flow out, as it does from the glands of the tongue."

Wharton, in 1656, gives an account of the anatomy of the thyroid, and notes that "it is more full of blood than any other gland, also more viscid and solid, and more resembling muscular flesh. This is the only difference that it is not a fibrous structure, but rather of a glutenous nature."

He ascribes four functions to the gland:—

1. "To take up certain superfluous moistures from the recurrent nerve and to bring them back again into the vascular system by their own lymph channels.

2. "To cherish the cartilages to which they are fixed, which are of rather a chilly nature, by their own heat, for they are copiously supplied with arteries and abound with blood, from whence they conveniently impart heat to the neighbouring parts.

3. "To conduce by their exudations to the lubrication of the larynx, and so to render the voice smoother, more melodious and sweeter.

4. "To contribute much to the rounded contour and beauty of the neck; for they fill up the empty spaces about the larynx, and make its protuberant part almost to subside and become smooth, especially in the female sex, to whom on this account a large gland has been assigned, which renders their necks more rounded and beautiful."

All the preceding theories serve to illustrate that the possibility of internal secretion had not been considered, and that functions of a greatly diverging nature, and working by vastly different mechanisms, had been ascribed to the ductless glands.

However, in 1776, Haller, in his text-book of Physiology, wrote concerning the thyroid as follows:—"Other distinguished men, when they had quite despaired of finding a duct, turned their attention to altogether different questions of importance. That a distinct fluid was secreted in that gland, which was received by the veins and duly added to the blood—a useful function, performed also by the spleen and thymus—was asserted by the great Rupert himself."

Thus, in 1776, we have the thyroid, thymus and spleen classed together as glands without ducts, which manufacture a special fluid, which is received into the veins, and so returned to the circulation. This conception is a great advance on any of the older theories, and as it refers to the thyroid, is not far different from our present opinion.

In 1845 a further step in the investigation of these organs was made. J. Müller, in his "Manual of Physiology," wrote:—"The ductless glands are alike in one particular—they either produce a definite change in the blood which circulates through them, or the lymph which they elaborate plays a special *rôle* in the formation of blood

or of chyle. In every instance venous blood and lymph are the only substances which pass into the general economy." Here we have the realisation that the essential function of these glands is the formation of a substance which is passed into the blood or lymph—in other words, that they produce an internal secretion. In 1856 Brown-Séquard described the fatal results following extirpation of the adrenals, and concluded that the blood received from these glands products which were essential to the life of the organism. Following this discovery, there seems to have been a period of quietude in this branch of physiology. During this period physiologists were thinking about these organs, and their morphological conception came to be accepted universally. At the same time, in the departments of histology and embryology, many discoveries were made which extended the knowledge of the constitution of their elements and the nature of their secretory cells. The researches of this period of quietude prepared the physiological world for the advance which was made in the conception of internal secretion by Brown-Séquard.

In 1891 this old man, then 72 years of age, startled the whole scientific world by stating, before the Academy of Paris, that he had experienced considerable rejuvenating effects, both physical and mental, by injecting into himself extracts of the testes of certain animals. The effects of these injections on this old gentleman are now considered by most physiologists to have been due to psychical suggestion, and his deductions from his experiments have undergone very severe and, to a large degree, well merited criticism. Brown-Séquard's achievement, however, lies in this: he assumed that the endocrinic glands supply principles to the blood which have an "elective" action upon certain organs, whether adjacent or removed from the gland. These principles were afterwards called hormones. His assumption suggested an inter-relationship between the various cells of the body by means *other than that of the nervous system.*

Thus was our present conception of the function of the ductless glands evolved.

Before proceeding further in the study of these bodies it is necessary to say something on the vexed subject of terminology. It is well known that the production of an internal secretion is not limited to glands without ducts. The pancreas, testicle, and other glands possessing ducts are known to produce an internal secretion. For this reason the term ductless gland has fallen into disrepute, and the term endocrine organ is used to designate any body, with or without a duct, which produces an internal secretion. The products of the secretion of these endocrine organs have been divided into two classes: firstly, those which stimulate cell functions, "hormones;" and, secondly, those which inhibit cell functions, "chalones." In this paper the older terminology will be adhered to in so far that the word hormone will be used to indicate both stimulating *and* inhibiting active principles.

Having traced briefly the history of the development of the theory of internal secretion, the question naturally presents itself—Of what nature are these chemical messengers which pass in the blood to influence numerous organs? The ordinary text-books on physiology dismiss this subject by stating that hormones are substances of "low molecular weight, which are not destroyed by short boiling." From this latter statement it is obvious that they are not of the nature of enzymes, which lose their cleavage power when heated to 60° C. The general properties of hormones are as follows:—

1. They are of low molecular weight.
2. They do not lose their power unless subjected to prolonged boiling.
3. They are rapidly destroyed by oxidising agents.
4. They are destroyed in the tissues on which they act, and do not escape in any of the excretions.
5. They are not, as a rule, absorbed unaltered from the alimentary canal.

Starling has pointed out that their action is very similar to that of certain drugs, chiefly those of organic origin, such as the vegetable alkaloids, which also operate by

immediate chemical action, being conveyed to the parts which they influence by the blood stream. As with these drugs, some of the principles yielded by the ductless glands act by stimulating cell functions.

Great light has been thrown on the chemistry of these substances by the isolation of the active principle of the adrenal medulla, which has also been synthesised in crystalline form; but it is only when the chemical constitution of other hormones has been discovered that we shall know whether they all belong to the same chemical family or not.

I now propose to attempt to give a rather fuller account of the methods by which the endocrine organs have been investigated, and to try to draw from the facts, as stated, a few conclusions as to which methods are likely to be of most service in future research. Foremost amongst the methods of investigation stands that of histological examination. It was the advent of the microscope which banished most of the old and fantastic conceptions of the cell functions of the ductless glands, and definitely proved the presence of secreting substance. Also, the effects of altered conditions—*e.g.*, starvation and disease—on the glands could not be properly appreciated without a means of observing the changes in their minute anatomy. It is no exaggeration, therefore, to state that the microscope is of vital importance, since on its use nearly all the other methods of research depend.

Extirpation is the next method of investigation which presents itself. This involves the removal of the gland and the observation of the results to the organism. The first extirpation experiment was performed by Raynaud, in 1834, when he removed the thyroid, but the practice of extirpation of the testicles existed in very remote times, though this operation seems to have been performed for domestic rather than scientific reasons! The information which can be obtained from this method of investigation is considerable. We can find whether the animal can survive the extirpation, and, if it does survive, in what way its normal functions are impaired. But to what degree

are we justified in accepting the results of these experiments and wherein lie the fallacies of this method? Firstly, most of the endocrinic glands are of large size, or deeply placed, and their removal involves extensive and prolonged operation, which may be highly dangerous to the animal. Illustrative of this is an account of the methods of extirpating the pituitary. The investigators may be divided into two schools—that of Horsley and that of Cushing.

Horsley removed the pituitary by approaching it through the buccal cavity and the basis cranii. This operation had the following disadvantages :—

Firstly, that the operator was working at the bottom of a deep pit from which blood was oozing; secondly, that asepsis was impossible. Cushing and his followers adopted a different mode of procedure. They made a large aperture in the side of the skull on one side, and a similar aperture on the opposite side, to enable them to push over the cerebral hemispheres in order to obtain a good view of the gland. The deductions of the two schools are very interesting. Horsley found that some of the animals survived his operation, and concluded that the pituitary body was not essential to life.

Cushing found that in almost all cases the extirpation proved fatal, and, therefore, considered the pituitary to be essential to life. He explains Horsley's results by saying that by the buccal method it is impossible to remove all the gland, while Horsley states that Cushing's animals died not from the absence of the pituitary, but from severe surgical shock, the result of the extensive operation on the cranial vault. After studying the description of these two methods of removing this gland, the conclusion forces itself upon the reader that it is extraordinary how any of the animals survived either operation !

This method of complete extirpation can be improved upon if the gland is removed in stages, the operation shock being thus greatly diminished. But even if we exclude operation damage, there are still considerable fallacies in this method of research. In certain cases it is impossible

to be sure if all the gland in question has been removed. This is, perhaps, best illustrated in the case of the parathyroids, concerning which so much discussion is still being held. A further difficulty is the presence of accessory bodies, which may occur in different situations from the main gland. These are left behind on its removal, thus largely modifying the effects of the extirpation. An example of this is the glomus caroticum, which is accessory to the adrenal medulla.

Extirpation has certain advantages, especially over pathological study of these glands. Firstly, the investigator is able to choose his own subject; and, secondly, he is able to localise the destructive process to a single tissue. From the foregoing facts it will be gathered that extirpation is not so useful a method of research as would at first appear, but it may give valuable results if carried out as follows :—

First, remove the gland by stages, and note the symptoms. Then transplant a gland from another animal into the subject, and if the graft "takes," see if this will cause the symptoms to disappear.

Another method of research is the destruction of certain tissue elements by cyto-toxic serums. Cyto-toxins which are destructive to certain cell organisms are injected into the blood. It is found, however, that these cyto-toxins do not act solely on the cells of the endocrine system, and so the accuracy of this method is vitiated. A more satisfactory means of destruction is by Röntgen rays. Some very interesting results have already been obtained, and it is possible that this method will contribute largely to our knowledge of these organs in the future. Direct stimulation by pressure or electricity has also been advocated as giving valuable information concerning internal secreting organs, but it cannot be regarded as a reliable method, since surrounding nerves and other structures react to the stimuli.

A careful study of embryology and comparative anatomy is also necessary if the true nature of the endocrine organs is to be appreciated. The dual origin of the supra-renals

prepares us for the discovery of the difference in function between its cortex and medulla. Comparative anatomy still further confirms this discovery, because in certain fishes the cortex and medulla of the supra-renal are absolutely separate organs; the cortical organ being called the inter-renal body. Removal of the inter-renal body causes death, and from this it is deduced that the cortex of the organ is the part which is essential to life. This conclusion could not be justified on our present evidence but for the study of the separate inter-renal body in this group of fishes. At the same time one is scarcely justified in assuming that a certain organ is exactly of the same relative importance in man and in one of the lower fishes. We all know that there is a considerable difference between the degree of cerebral control in man and in the lower fishes, and quite possibly there is a similar difference in the relative importance of the adrenal cortex.

All the preceding methods are beyond the scope of the average student or doctor, who has no time and often little inclination for tedious research. Nevertheless, it is not to be supposed that the practising physician has contributed, or can contribute, nothing to our knowledge of the endocrine organs. One of the greatest stimuli which the study of these organs received came from Addison when he described the results of that disease of the supra-renals which has since been known by his name. It is interesting to note that this eminent physician made his discovery while searching for the cause of pernicious anæmia, which still baffles us as to its origin. Since Addison's days lesions of the different ductless glands have been described, and much valuable information has been obtained from the clinician and pathologist. Swale Vincent, in his book, writes:—"One of the methods which will yield most valuable results in the near future is the oldest of all—namely, careful study of clinical conditions and a patient investigation of pathological anatomical findings. It is to the pathologist and clinician, then, that we must look for much further enlightenment, and it is only by close co-operation

between the bio-chemist, physiologist, pathologist, and physician that the conception of the true significance of these organs will be evolved."

And now we come to the last method of investigation—the administration of extracts. A gland is taken and pounded up and extracted with certain substances, and after purification this extract is administered to an animal and the results are noted. No mode of investigation has been the cause of so much contention, and leading scientists even still hold widely differing views as to its value as a method of research.

One of the most brilliant of French physiologists, E. Gley, has described this method of investigation as "vitiated by error," but, on the other hand, some distinguished scientists—*e.g.*, Oliver and Schäfer—attach much importance to the results obtained by administering gland extracts. Gley contends that there is no *à priori* proof that the substances present in the extract are normally and regularly excreted in the venous blood of the gland from which the extract is obtained. There are also three sets of experimental facts which militate against the physiological significance ascribed to the administration of organic extracts. First, the fact that extracts from an enormous number of organs possess physiological action tends to prove not a specific but rather a pharmacodynamic property. For example, there is scarcely a single tissue whose extract will not have a profound effect in lowering blood-pressure. It must be admitted, however, that few tissues but those of the endocrine system yield extracts which give rise to a large number of specific results. Tissue extracts generally have an effect on the blood-pressure, but they do not, for example, induce the characteristic train of symptoms which follow administration of extract of thyroid gland—*i.e.*, tachycardia, nervous excitability, flushing of the skin, increase of perspiration, increase of nitrogen metabolism, and—in extreme cases—exophthalmos. Such results are most probably specific for the particular extract, and we are justified in thinking that the tissue extracts generally do not possess the same selective powers as those of the endocrine system.

The second objectio to research by means of extracts

is the phenomenon of rapid immunisation from the toxic or physiological effects of many extracts, while the action of a true internal secretion is repeated quasi-indefinitely. Extracts of the pituitary body when injected for the first time cause a marked rise in blood-pressure. If another injection is administered 30 minutes after the first, it usually produces no effect, or it may even cause the blood-pressure to *fall* slightly. If extracts of the glands contain their active principles, such a result is difficult to explain. Schäfer has done so by assuming that the extract contains two hormones, one of which is antagonistic to the other, and which, it is to be assumed, acts only after two injections. Such an explanation has as yet received no experimental proof whatsoever.

The third objection to extracts as a means of physiological investigation is that certain of them have to be employed in enormous quantities before a characteristic physiological effect is produced—quantities the weight of which represents the total mass of one or even more specific glands. This would suggest that some change has taken place in the active principle during the extraction of the gland, and offers a stumbling block to Schäfer's school when it is recalled that the amount of adrenalin circulating in the blood and formed daily is very small. The isolation of the active principle of the adrenal medulla from the supra-renal vein may possibly help in at last deciding the vexed question of whether the active substance of the extract is the same as that which the gland normally passes into the blood.

We know that the physiological action of adrenalin, an action of stimulating the true sympathetic nervous system, is possessed also by a large number of amines. The closer the structure of the amine approaches to that of adrenalin the more intense and specific is its sympatho-mimetic action. This shows that an extract giving similar results to those produced by stimulation of the gland must, at any rate, approximate to the active principle of the gland in chemical constitution.

(*To be continued.*)

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

RECENT WORKS ON FEVERS.

1. *Fevers in the Tropics.* By Sir Leonard Rogers, Kt., C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S., Lt.-Col., I.M.S.; Professor of Pathology, Medical College, Calcutta; Honorary Member of the American Society of Tropical Diseases, of the Philippines Medical Society, and of the Cambridge Philosophical Society. Third Edition. London: Henry Frowde and Hodder & Stoughton. 1919. Large 8vo. Pp xii + 404.
2. *Cerebro-Spinal Fever: the Etiology, Symptomatology, Diagnosis and Treatment of Epidemic Cerebro-spinal Meningitis.* By C. Worster-Drought, M.A., M.B. Cantab., Captain (Temp.), R.A.M.C.; Officer-in-charge Cerebro-Spinal Fever Ward, and Neurologist to the Royal Herbert Hospital, Woolwich; Medical Registrar, West End Hospital for Nervous Diseases; and Alex. Mills Kennedy, M.D. Glasg.; Captain late R.A.M.C.; late Officer-in-charge Cerebro-Spinal Fever Laboratory, and Bacteriologist to the Royal Herbert Hospital, Woolwich. London: A. & C. Black. 1919. Demy 8vo. Pp. xxii + 514, with 8 Plates and 56 Line Illustrations.
3. *Trench Fever: a Louse-borne Disease.* By Major W. Byam, R.A.M.C.; Captains J. H. Carroll, U.S.R.; J. H. Churchill, R.A.M.C. (T.); Lyn Dimond, R.A.M.C.; V. E. Sorapuree, R.A.M.C.; R. M. Wilson, R.A.M.C., and Ll. Lloyd, R.A.M.C. (T.), Entomologist. London: Henry Frowde and Hodder & Stoughton. 1919. Demy 8vo. Pp. xvi + 196.

When a reader peruses these or similar modern treatises on the fever process and the acute infections, he cannot but reflect on the complete omission in their pages of all

reference to the rich bibliography of fever in the nineteenth century. Murchison, Curschmann and Osler are quoted in the section on typhoid fever, but the great names of Cheyne, Louis, William Stokes, William Jenner, and Liebermeister, not to mention others of less note, are not once mentioned. This is, of course, accounted for partly by the advances of late years in bacteriology, which have thrown such a light on the ætiology of fever, and partly by the remarkable development which has taken place in the study of tropical diseases—an incident in the recent history of the far-flung British Empire.

1. As Sir Leonard Rogers points out in his Preface, "ten years of very active advance in tropical medicine have passed since the first edition of this work appeared, and eight since the partial revision for the second edition. Very extensive alterations and additions have, therefore, become necessary to bring it up-to-date." Sir Leonard gratefully acknowledges the immense help he has received in his task from the two reviews of recent advances in tropical medicine of the Wellcome Research Laboratories, Khartoum, of 1908 and 1911, by Dr. Balfour and Captain Archibald, the "Yellow Fever Bureau Bulletin" of the Liverpool School of Tropical Medicine, and the "Kala-azar and Tropical Diseases Bulletins" published by the Royal Society under the Editorship of Dr. A. G. Bagshawe and Dr. Wenyon.

The work is divided into two parts—A. and B. Under A. fevers of long duration are described. They are in sequence:—Kala-azar (the section on which has been largely rewritten); trypanosomiasis (including sleeping sickness and American trypanosomiasis or Chagas' disease), enteric fever (typhoid and paratyphoid), typhus fever and typhus-like fevers, relapsing fever and African tick fever, infective jaundice or Spirochætosis icterohæmorrhagica, undulant or Malta fever, amœbic hepatitis, unclassified long fevers ("low fever"—chronic fever with joint affection—Bacillus coli communis fevers), Oroya fever of Peru, and—last not least—"Trench fever."

In Part B. fevers of short duration are considered. They are :—Malarial fevers, epidemic dengue (sporadic dengue, or "seven-day fever of Calcutta"; pappataci or "three-day fever," which is of especially wide-spread prevalence in the Punjâb and in the countries bordering on the Mediterranean); plague, yellow fever, heat-stroke (sunstroke and effects of heat)—this last a fine monograph.

In a separate or closing Section (XVII.) an account is given of the incidence of various specific fevers in the Tropical East. Cerebro-spinal fever in India is briefly described; also influenza, illustrated by its seasonal prevalence in Calcutta in 1892. Lastly, the total and seasonal prevalence of the exanthematous diseases in the East is shown to differ greatly from that of those diseases in the temperate parts of Europe and America. This point comes out very clearly in a table giving the monthly and quarterly prevalence of the exanthemata in the European General Hospital, Calcutta, during the past three years. For this table the author expresses his indebtedness to Assistant-Surgeon A. A. E. Baptist. It is an interesting fact that not a single case of Scarlatina was admitted during the three years. It would appear that this disease is very rarely met with in India. When it does occur it is imported, is usually of a mild type, shows no tendency to spread widely, on the contrary rapidly dies out, especially in the hotter parts of the country, and seldom, if ever, attacks natives.

The volume contains many valuable hints on therapeutics, such as the antimony treatment of Kala-azar and the use of the arsenic and antimonial group of drugs in trypanosomiasis, and such like. Also, it is fully illustrated by a beautiful coloured frontispiece showing the parasites of malarial fevers and Kala-azar, in addition to which there are eight full-page plates, five diagrams, two other illustrations in the text, and no fewer than 85 temperature charts.

There is one notable omission in this fine work. Its pages contain no allusion to Cholera, which is surely both an acute infection, and a fever, too, should the patient

live long enough for a reaction from the collapse stage to take place. This omission is all the more strange as India in particular is so much indebted to Sir Leonard Rogers in disarming this formidable malady of its terrors by the intravenous injection of hypertonic saline solutions.

2. The treatise on Cerebro-spinal Fever is the joint work of Dr. C. Worster-Drought and Dr. Alex. Mills Kennedy. It forms one of the Edinburgh Medical Series, of which the General Editor is John D. Comrie, M.A., B.Sc., M.D., F.R.C.P.E.

During the past few years considerable progress has been made in the bacteriology, diagnosis, and treatment of Cerebro-Spinal Fever. The outbreak of this disease in England in 1915 and the methods adopted in the Army to combat it afforded exceptional opportunities for its study.

As one was a neurlogist and the other a pathologist and bacteriologist, the authors of the present work were fortunately placed for the investigation of cerebro-spinal fever in all its aspects. Being both posted for duty at Woolwich they became responsible for the investigation, prevention, and treatment of this disease among the troops in the Woolwich Military District. This monograph contains the results of their work and includes observations extending over a period of more than three years. It deals exhaustively with the subject from all aspects and incorporates the authors' own original observations and investigations, as well as extensive reference to the recent literature on the subject.

There are twenty chapters in all. One large chapter is devoted to the bacteriology of the disease, and gives a full discussion of the Meningococcus and its allied organisms. The symptoms, course, complications, diagnosis and treatment—largely based on the authors' series of cases—each furnish a large chapter. In discussing the treatment of the disease full instructions are given for the performance of lumbar puncture and the intrathecal administration of serum, with illustrative photographs of

the actual operation. Further chapters are devoted to the dissemination of the disease, predisposing causes, incubation period and mode of invasion, pathology and morbid anatomy, prognosis, the cerebro-spinal fluid, the blood, sequelæ, and serum disease.

The question of "Contacts" and "Carriers" is fully dealt with, and the chapter on the Cerebro-Spinal Fluid is a detailed laboratory study, including chemical, cytological, bacteriological, and "serological" findings.

The book will prove valuable to all those who at any time may have to deal with the disease in either an epidemic or a sporadic form. It will also commend itself to the laboratory worker.

3. TRENCH FEVER has attracted much notice during what is happily the late war, and no wonder, for Major W. Byam points out in his Preface to this highly important monograph that this malady has been responsible for a greater amount of sickness than any other infection on the Western Front.

The clinical and pathological work on which this very complete and altogether admirable account of trench fever is based was carried out at Hampstead for the War Office Trench Fever Investigation Committee, of which Major-General Sir David Bruce, K.C.B., F.R.S., A.M.S., is Chairman. The expenses connected with the experimental work of the investigation were defrayed by the Lister Institute.

In the Preface also Major Byam states that trench fever probably has existed from ancient times. But we cannot go as far as a German writer, Werner by name, who mentions in a paper published in the *Berliner klinische Wochenschrift* for February, 1917, that he came across an epic poem of the twelfth century called *Meister-Isengrimmus*, in which the following hexameter appeared:

"Aut habet aut fingit quintanæ frigore febris."

On the slender evidence afforded by this line, Werner surmises that this "five-day fever" was none other than trench fever. It is quite as likely to have been spirillum

or relapsing fever, the exciting cause of which is known to be a spirochæte discovered by Obermeyer of Vienna.

Major Byam gives the timely caution that trench fever may become a disease of peace unless its character, mode of spread, and intermediate host—both the body louse and the head louse—are understood by the profession at large. In connection with the ætiology of the disease Major Byam states that the sufferer from scabies presents skin lesions which predispose to infection with trench fever and scratches himself in a way that will ensure inoculation if the trench fever virus is present.

The contents of this fine monograph, which is the work of seven collaborators, whose names and qualifications are given above, are included in eight chapters. The respective headings are : The Acute Disease, Mode of Transmission of Trench Fever, Immunity, Pathology, Distribution of Louse-borne Diseases, the Chronic Disease, Prognosis and Treatment, and Prophylaxis. The "fly in the ointment" is the failure so far to discover and identify the parasite which is the *causa causans* of trench fever. This has, up to the present, eluded the most careful and searching investigation. All that is known on the subject is set forth and fully described in Chapter IV. on the Pathology of Trench Fever. Louse excreta have been examined at the Lister Institute by Arkwright, Bacot, and Martin Duncan (*Brit. Med. Journal*, Sept. 21, 1918). They confirm the constant presence, after a suitable lapse of time, of rickettsia bodies in lice which have been fed on a trench fever patient.

"Rickettsia bodies" were first described by Ricketts (*Journ. of the American Med. Association*, Jan. 30, 1909) as occurring in the blood of patients and in the insect vector of Rocky Mountain spotted fever. Later they were described by Ricketts and Wilder (*Journ. Amer. Med. Assoc.*, April 23, 1910) in typhus fever under similar conditions.

Rickettsia bodies resemble diplococci or bipolar bacilli of very small size—0.3 by 0.3 to 1.5 microns—are non-motile and are best demonstrated by staining for sixteen to twenty hours with weak Giemsa stain (1 drop per

c. cm.). Attempts to grow the parasite on artificial media have usually failed, though some successful cultures have been reported. There the matter stands.

There are four appendices. The first contains an epitome of the experiments performed in the course of the research carried out at Hampstead. The fourth gives a summary, by Lieut. R. H. Vercoe, R.A.M.C., of the Report of the Commission of the American Red Cross Research Committee on Trench Fever. The work of the Commission was begun at the end of January, 1918, and was carried on during the following two months at a B. E. F. Stationary Hospital, which was near enough to the fighting line to secure cases of trench fever in the very early stages of the disease.

J. W. M.

Diseases of Women, by Ten Teachers. Under the direction of COMYNS BERKELEY, M.A., M.D., M.C. (Cantab.), F.R.C.P. (Lond.). Edited by COMYNS BERKELEY, H. RUSSELL ANDREWS, and J. S. FAIRBAIRN. London: Edward Arnold. 1919. Large 8vo. Pp. xii + 650.

WHEN reviewing "Midwifery" by Ten Teachers we said, "two many cooks spoil the broth," and we regret that the praiseworthy attempt by the ten able gynæcologists who have produced the work under review has ended as the broth did—in an unpalatable dish. It is unnecessary to mention that there is much to be learned, but the whole thing would have been more useful, had *one* of the authors made it his individual effort. To quote an example, in considering the treatment of tuberculosis of the Fallopian tubes: "As the uterus is frequently affected as well as the Fallopian tubes, it should be removed; and as the disease is usually bilateral, both appendages will have to be sacrificed. If for any reason it is decided not to remove the uterus, the uterine ends of the tubes must be cut off very close to the uterus." Very evidently there was a divergence of view on this point, and the result is that the student is at sea as to the correct treatment. Again, regarding the treatment of acute salpingitis. It is said

the question is not settled: a student or practitioner requires to know something definite in such a serious condition. Could not one of the ten have told him what to do? We are glad to note that the authors adopt a most rational view about the over-discussed chronic endometritis. We are confident this is an editorial slip—"salpingitis set up by the tubercle bacillus is seen comparatively frequent."

This book is too expensive. In it there is much to praise and much to blame, but it is extremely difficult to know what class of practitioner will require it.

B. S.

Dental Surgery and Pathology. By J. F. COLYER, F.R.C.S., L.D.S., &c. Fourth Edition, with Illustrations. London: Longmans, Green & Co.. 1919. Demy 8vo. Pp. xiv + 899.

THAT a fourth edition of this well known publication should have been called for within eight years, during four of which a great war has been waged, interrupting very seriously the appearance of new books, goes to prove how widely the work is appreciated. The arrangement of material in this edition does not greatly vary from that holding in the last, but, generally, details have been extended and brought up-to-date, enhanced also, in many instances, by further excellent illustrations. At first glance some surprise may be felt at the brevity of the chapter upon Fractures of the Jaws—a subject upon which the author is so recognised an authority—but we agree with him that this subject is one coming more properly within the domain of the general rather than that of the dental surgeon.

The manual is one which we can cordially recommend to the notice of students of dentistry, and one which cannot but enhance Mr. Colyer's reputation.

Messrs. Longmans, Green & Co. have adhered to the previous form of this book, the printing, illustrating and generai turn-out of which do them much credit.

G. P. M.

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

IRISH PUBLIC HEALTH COUNCIL.

The first meeting of the Council was held at the Council Offices, No. 33 St. Stephen's Green, on Thursday, 2nd October, 1919, the Chairman, Dr. E. Coey Biggar, presiding, and the following members being present:—Dr. Alice Barry, D.P.H.; Edmund Bourke, Esq., C.B.; J. Drennan, Esq.; Mrs. M. L. Dickie, Sir James Gallagher, Sir Joseph Glynn, J. Ewing Johnston, Esq., M.B.E., M.R.C.V.S.; Rev. P. Kerlin, C.C.; Dr. W. J. Maguire, Sir John W. Moore, D.P.H.; Mrs. McMordie, C.B.E.; Dr. R. J. Rowlette, and Sir William J. Thompson.

The Secretary, Major Geo. A. Harris, D.S.O., was in attendance.

The Chairman read letters of apology for non-attendance from the Countess of Kenmare and the Right Hon. Sir Henry A. Robinson.

The Chairman then read his opening address as follows:—

Ladies and Gentlemen,

I have been asked by the Chief Secretary to express to you his sincere regret at not being able to be present here to-day. As you know, he is detained in London under circumstances over which he has no control. He hopes, however, at an early meeting of the Council to thank the members personally, and to answer any points on which they may desire information from him.

He has directed me to express to you his thanks for your kindness in consenting to act on the Public Health Council, and to convey to you the deep sense of gratitude he feels in finding that the representatives of the great Health Departments and Organisations and Public Bodies in the

country have shown themselves so willing and ready to help in the important and necessary work of carrying out health reforms in Ireland.

Before proceeding further, I would like personally to express my appreciation of the great honour which the Minister of Health has conferred on me in inviting me to act as Chairman of the Council. I have accepted the invitation with some hesitation, realising as I do the great responsibility of the position. I also desire, on my own behalf, to thank every member of the Council for their kindness in allowing themselves to be nominated as members. I am sure that we will all work with one object in view, which is to concentrate our thoughts on the vast problems whereby the health services of this country can be placed on the best possible basis.

I will now briefly indicate the Minister's wishes and intentions.

His idea is that the Public Health Council as now constituted is merely a temporary body formed to advise him as Minister of Health as to the steps to be taken for the improvement of the public health.

For this purpose he has been careful to select as its members the representatives of the different existing authorities charged with public health functions throughout the country, and it is now his aim to formulate, with the advice and assistance of these members, a comprehensive scheme of public health to be incorporated in a Bill to be submitted to Parliament. He desires it to be understood that, generally speaking, the functions of the Council will be to prepare a legislative programme, and the Minister hopes that the work of preparing material for the Bill will be undertaken with all possible expedition.

It goes without saying that health is of the highest importance, and its protection and preservation are essential for social and material progress. Health is something more than the absence of disease, it requires comfortable conditions of life, suitable food and clothing, proper housing, satisfactory conditions for work, rest and recreation.

The Prime Minister did a great service in drawing attention in his speech at Manchester on September 12th, 1918, to the fact that if the health of the people had been looked after we should have been able to put into the fighting ranks at

least a million more men, and the war would by that date have ended triumphantly.

A population which deserves the term "healthy" ought to yield the following per 1,000 men:—700 Grade I, 200 Grade II, 75 Grade III (for sedentary work), and only 25 physically incapable. Yet, many towns in England and Scotland produced only 200 Grade I, 250 Grade II, 450 Grade III, and 100 Grade IV. As conscription did not apply to Ireland, I am not able to give any figures for Irish towns, but I doubt if they are much better than some of the English and Scotch towns.

These statistics prove that Mr. Lloyd George's statement was well within the mark. The Premier also said that the cause of the deterioration was in the home.

As you are all doubtless aware, Public Health legislation in England differs greatly from that enacted for Ireland, and any of you who have followed the recent debates in Parliament will understand why it was necessary to establish this Public Health Council.

The heads of the three great Public Departments which are connected with public health are members of this Council, and the Minister hopes that they will co-operate in assisting him to frame the legislative measures necessary to secure the desired reforms in the health services and conditions of Ireland.

Turning now to the powers and duties which have been entrusted to the Minister of Health for Ireland, it will be observed from Section 10 of the Act of this year, that these powers and duties are identical with those vested in the Minister of Health for England, and I need not take up your time in referring to them at length, but will endeavour to indicate to you shortly the more important and pressing problems which this Council will have to take into consideration and deal with.

We have been entrusted with the requisite authority for making inquiry into the present system of health administration, with a view to advising the Minister of Health for Ireland as to the steps to be taken to secure the preparation, effecting, carrying out, and co-ordination of measures conducive to health, including measures for the prevention and cure of diseases, the treatment and care of the blind, the initiation and direction of research, the collection, preparation, publication and dissemination of information and

statistics relating thereto, and the training of persons for health services. It will, therefore, be seen that Parliament has given us power to make the widest investigations into practically all the important branches of Public Health with which most of the social economic questions are intimately connected.

The Public Health Act of 1878 and the subsequent Acts are chiefly concerned with the correction of sanitary defects, the isolation and treatment of infectious disease, provision of water supplies and sewage systems, rather than with the correction of individual physical defects, which lead to impaired health.

During the last few years attempts have been made to rectify these defects, and at least seven Acts of Parliament have been passed with the primary object of preventing rather than treating sickness. Among the most important of these Acts are:—

Notification of Births (Extension) Act ...	1915.
Provision of Meals Acts	1914-1917.
Midwives (Ireland) Act	1918.
Housing (Ireland) Act	1919.
Medical Inspection and Treatment of School Children Act	1919.

These Acts have all been initiated by the Local Government Board for Ireland. In addition, the Insurance Commission have never lost an opportunity of endeavouring to secure amendments in their original Act, with a view to securing more efficient working of the Insurance system.

Despite the fact that no country can boast of more highly skilled physicians and surgeons, better equipped hospitals, or a more comprehensive system for the medical treatment of sickness of the poor, it must be confessed that everything possible has not been done to prevent and treat disease in this country. It will be one of the chief functions of the Public Health Council to suggest the remedy for this state of affairs, and to present as their right to all sick persons, not only some medical treatment, but the best possible treatment.

Our cities are provided with well equipped and well staffed hospitals, which give to the poor specialist and operative treatment in no respect inferior to that available to the wealthy. An extension of the system of pay-patients would help immensely that very large class of persons who are

better off than the working class, and who therefore do not care to seek free treatment as a charity and yet cannot afford specialists and private hospitals.

The same excellent conditions do not unfortunately hold in the smaller towns and in the country; often the only hospital accommodation is in the Union Infirmary with its so-called pauper taint, or in the County Infirmary too often handicapped by lack of funds, and subject to conditions and limitations imposed by an Act of Parliament passed in 1765.

Neither in the rural districts nor in the smaller towns are those who are in most need of the highest medical or surgical skill or prolonged institutional treatment, radium, *X*-ray, &c., cared for as their condition demands.

To improve matters the former should be completely divorced from the workhouse, and the latter given sufficient public money to modernise its equipment. Both are, however, useless without efficient staffs, and it is hopeless to expect to obtain and to keep these unless the conditions of service are improved.

The fact that County Councils, although entrusted with health and medical administration, are not sanitary authorities within the meaning of the Public Health Acts, has proved to be inconvenient. For instance, although a County Council may undertake the management of Sanatoriums and Dispensaries for the treatment of Tuberculosis, and appoint a medical staff for certain specific purposes, such as Tuberculosis, Medical Treatment of School Children, or a scheme under the Public Health Act, 1917, there is no power to appoint a County Medical Officer of Health for the general superintendence of health matters in the county.

This defect can be remedied only by an Act of Parliament.

The same so-called pauper taint is frequently applied to the dispensaries, which also require to be better equipped and modernised.

The obvious remedies by which these services may be improved would be by rewarding the skill and efficiency of the medical officers by a system of promotion to better positions, a more equable scale of salaries, increased facilities for better treatment and compulsory study-leave every few years, which would enable every Medical Officer to keep abreast of the times by learning the most modern methods of diagnosis and treatment.

There must be a great extension in the providing of trained

nurses to the sick. At present the only nurses available are those of such voluntary societies as the Queen Victoria Jubilee Nurses' Association and the Lady Dudley Nursing Association, and the excellent work accomplished by these organisations demonstrates clearly the urgent need for the extension of this work till every district would have at least one nurse. Efficient nursing is often more than half the battle in the fight which the doctor wages against death.

Properly qualified dental surgeons are urgently required, particularly in country districts, the inhabitants of which are often compelled to seek the assistance of unqualified persons. Possibly a system of itinerant dentists might partially meet the need, which is very real, for decayed teeth are a fruitful source of chronic ill-health.

The anti-tuberculosis measures already adopted require consideration and enlargement. We cannot hope to lessen the ravages of this disease to any great extent until every county has its medical officer, its dispensaries, its observation wards for suspicious cases, and arrangements for the isolation and treatment of open cases, whether these are early or advanced.

In Ireland the facilities for laboratory diagnosis of disease are totally inadequate. Only a few counties have appointed a pathologist. A doctor who has no ready means of obtaining a report on pathological material is very greatly handicapped in making a diagnosis, which may make all the difference between the life and death of his patient. Every doctor should be able to obtain the help of an expert pathologist when required. He should also be able to obtain when necessary such modern aids to treatment as vaccines and therapeutic serums.

The field of Preventive Medicine in Ireland is as yet almost unexplored. It is one of the most important branches, and has been too long neglected.

The Notification of Births (Extension) Act, 1915, marks a new era in Preventive Medicine, as this Act was designed for the purpose of ensuring that the health and physical welfare of the mother, both before and after the birth of her child, are looked after, as well as those of the child from the time of its birth onward till it reaches the age of five years.

In order to encourage Health Authorities to undertake the care of mothers and children the State has come to their assistance, and defrays half the cost of maternity and child

welfare schemes. From the age of five years, which may be regarded as the school age, the child will come within the scope of the Medical Treatment of School Children Act, 1919.

Under this Act County and County Borough Councils are compelled to provide for the medical inspection of school children, and to make arrangements for attending to their health and physical condition. In the exercise of these duties the Councils will act under regulations to be made by the Local Government Board, with the approval of the Treasury and the Commissioners of National Education for Ireland. Parliament will provide one-half the cost of this service, and the remaining half will be borne by the rates. You will see at once that this duty if properly carried out will involve a considerable charge not only on the rates but also on the State; and it is of the utmost importance that the manner in which the Act is to be administered should be carefully thought out.

The examination for the detection of tuberculosis, adenoids, defects of vision, hearing, and dentition requires extreme care if tendencies towards future serious defects are to be disclosed. There are many physical defects which interfere with the progress of the child's education which escape the notice of parents until they pass the stage at which they can be easily remedied. It is, therefore, of the greatest importance that the regulations to be drawn up will ensure that this branch of health administration shall be thoroughly and scientifically carried out, as a mere perfunctory examination would be worse than useless.

The Local Government Board have not yet formulated their regulations, and have asked this Council to assist them in this respect, and the Commissioners of National Education have also signified their willingness that the Public Health Council should co-operate and assist in the matter. It would appear, therefore, that one of the first duties of this Council will be to endeavour to secure that the intentions of Parliament in regard to the medical treatment of school children are efficiently and economically carried into effect.

You will observe, therefore, that the health of the child can be continuously looked after by the Health Authorities from its birth until it leaves school, the State contributing one-half the expenditure and the rates being responsible for

the remaining half. At the end of the school period the child will automatically come under the provisions of the National Health Insurance (Ireland) Act, and accordingly with a proper and efficient service and administration there will be no reason why any child should suffer from any defect which is capable of being remedied or prevented.

Of the other preventive measures which come within the scope of the Council, one of the most important is in relation to the milk supply, which is at present far from satisfactory.

Another is the question of the improvement of the housing conditions of the people. A special Committee in connection with the Local Government Board has already been appointed to deal with this problem, and the Government have arranged to give most liberal assistance to Local Authorities to enable them to provide commodious and healthy dwellings.

I will not weary you by referring to the other problems that will come before you for consideration, and it may be sufficient for the present if I point out that this Council will have to deal with the initiation and direction of research on all subjects affecting or relating to health. The war has shown how much can be done by organised research in the investigation and treatment of disease, and it should be possible to obtain even better results in these times of peace.

I am sure that you will realise from what I have stated above that this Council will have an important and onerous duty to perform in assisting the Minister to secure the much needed reform of the health services and conditions in Ireland, and I feel confident that the Minister can rely on the wholehearted support of every member of this Council in attaining that end.

On the conclusion of the address a vote of thanks to the Chairman was passed on the motion of Sir John Moore, seconded by Sir William Thompson.

An informal discussion then took place regarding the nature and conduct of business to be transacted at future meetings of the Council, and it was arranged, on the suggestion of Sir Joseph Glynn, that complete copies of the Minutes of Proceedings (including the Chairman's address) would be transmitted to the members of the Council as soon as possible after each meeting.

It was also decided, on the suggestion of Dr. Maguire, that the Secretary should prepare draft rules for the conduct of business at meetings.

The Chairman explained that no fixed rules could be laid down as regards the holding of meetings, as it might be necessary to conform to the wishes of the Minister in this respect.

Meetings would be convened by the Minister or Chairman when required, and, generally speaking, would be held at intervals of about three weeks or a month, if not oftener.

Dr. Maguire inquired whether in the event of new legislation being framed the Chairman proposed to call in any witnesses or outside assistance.

The Chairman stated that he did not think that would be necessary at present, but it would always be open to the Council to invite or consider representations or opinions of the Medical Profession or of other organisations.

Sir Joseph Glynn suggested that as a preliminary to any discussion on the reform of Public Health legislation the Health Departments should prepare and furnish to the Council synopses of the Acts administered by them, with recommendations as to any desirable amendments. The Chairman agreed that this would be of considerable assistance, and stated that it would probably be necessary to ask the Departments concerned for some such statements later on.

Dr. Rowlette raised the question of admitting the Press to the Council meetings. After discussion it was agreed that it would not be desirable to do so, as it might at times prove embarrassing if matters of a confidential nature were being discussed. It was decided, however, to furnish a Summary of Proceedings to the Press in accordance with the usual practice.

The Chairman then drew attention to a letter that had been received from the Local Government Board inviting the co-operation of the Council in the formulation of Regulations for the administration of the Medical Inspection of School Children Act, 1919. He stated that there had been no one to deal with the matter in detail yet, but he hoped to be in a position to go into it more fully at the next meeting, and he indicated that it might be necessary to appoint a small Committee to assist in the preparation of the Regulations.

A short discussion then took place on the question of new health legislation, and several of the members suggested that the Council might consider the question of the co-ordination of the functions of the various departments dealing with health under one Department, and suggested various phases of health administration that might be brought into the purview of the Bill.

The Rev. Father Kerlin inquired whether it was proposed to establish any Consultative Councils as contemplated in the Act.

The Chairman stated that it may be necessary to establish such Councils later on, when the Minister and the Council have seen their way more clearly. At present, however, no useful purpose would be served by acting hastily in the matter, and, in any case, the rules for the establishment of these Councils would have to lie on the Table of the House of Commons for thirty days before they could be effective.

Father Kerlin also referred to the statement in the Chairman's address regarding the temporary status of the Public Health Council, and pointed out that it was a statutory body, and would require an Act of Parliament to dissolve it, or alter its constitution. The Chairman agreed with him, but referred to the fact that the function of the Council was to frame an Act for the improvement of the Health Services and conditions in Ireland, which Act would in all probability involve some modification in the constitution and functions of the Council.

Mr. Johnston then read the following statement on the Veterinary services in Ireland:—

I understand the principal object the Chief Secretary for Ireland had in view when he decided on constituting a Consultative Committee in connection with questions of Public Health was to seek information as to the real requirements of this country, and, having obtained sufficient data upon which to act, to introduce a measure in Parliament for the creation of a Ministry of Public Health for Ireland.

I wish to take this early opportunity of assuring Mr. MacPherson and Dr. Coey Bigger that they may depend upon the members of my profession generally, and particularly upon the members of the North of Ireland Veterinary Medical Association, of which I have the honour to be Presi-

dent, to render him and this Committee all the assistance in their power towards the successful accomplishment of this very laudable and vitally necessary object.

The Members of the North of Ireland Veterinary Medical Association have for years endeavoured to further this matter and have repeatedly demonstrated how absolutely essential to the well-being of the community such a Ministry would be. It needs but little argument to convince those who take an earnest interest in the subject that such a Ministry would be incomplete and ineffective if it failed to establish a thoroughly complete and well equipped Veterinary Section to control and advise in all matters pertaining to animals and animal products.

Contagious and infectious disease spreads from animal to animal, from animal to man, and from man to animal. Many diseases of animals are inimical to the human race, and no measures that you can formulate for the eradication of certain affections in man can be successful if you allow those diseases to propagate amongst our domesticated live-stock, and then allow diseased flesh and infected animal products to be used as human food—thus supplying fruitful sources of re-infection.

To deal with such matters you must have Central Authority with uniform regulations to be enforced in a uniform manner.

The various methods of the present day, inefficient, disjointed and irregular as they are, must be "scrapped," and all work of the nature suggested must be brought within the scope of the proposed Ministry.

I would like, before concluding, to say that the Veterinary Profession feel very grateful to the Chief Secretary for the courteous manner in which he received the views put forward by the North of Ireland Veterinary Medical Association at the recent interview in Belfast, and we are more than gratified in believing that the case he presented to him was convincing, as is evidenced by my presence here to-day.

The Chairman on behalf of the Council thanked Mr. Johnston for the valuable suggestions made by him, but pointed out that it would be necessary to consider his recommendations very carefully in order to avoid any overlapping or interference with the functions of the Department of Agriculture.

Dr. Maguire suggested, and it was agreed, that Mr.

Johnston should prepare for a future meeting of the Council a memorandum embodying in detail his proposals.

Before adjourning, it was ascertained that the most suitable day and hour for future meetings of the Council would be Tuesdays, at 11.15 a.m., and it was agreed that the meetings would be held accordingly, as far as possible.

NEW PREPARATIONS.

"ENOLIN" TOOTH PASTE.

In these days of Ministries of Health it is hardly necessary to urge the need for the frequent use of an efficient antiseptic tooth-paste. The care of the teeth is daily attracting more and more attention not only from the members of the Medical Profession but also from the public in general. Hence it is that we desire to state the claims which are advanced by an all-British dentrifice, recently introduced by the firm of Messrs. A. & E. Carreras, of 207 King Street, Hammersmith, London, W.6, and to which the name of "Enolin" has been given. In the preparation of this really elegant tooth-paste two leading principles have been kept in view—(1) The introduction of materials which, whilst *cleaning* the teeth, have the minimum of scratching action, and consequently provide no risk of the slightest injury to the enamel of the teeth. (2) The production of a copious foam, so useful as a lubricant for the removal of foreign matter from the teeth, and which penetrates into every crevice and interstice of the teeth, attacking the decay germs located there, at the same time being devoid of any unpleasant soapy taste. In addition to various essential oils (in themselves useful antiseptics) of the highest quality used in the manufacture of "Enolin" Tooth Paste, the inclusion of a very powerful antiseptic, especially selected because of its freedom from unpleasant taste or burning effect, enhances the germicidal power of the preparation. The combination of the ingredients is so effective that when tested against *B. Typhosus*—the organism used as the standard in the Rideal-Walker test—namely, a dilution of phenol, *e.g.*, of the strength of 1 in 120—"Enolin" Tooth Paste is found to sterilise after a short contact. This dentrifice is pleasant to use, and leaves a refreshing and agreeable taste in the mouth.

METEOROLOGICAL NOTES.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ *N., Long.* 6° 15′ *W., for the Month of August,* 1919.

Mean Height of Barometer, - - -	30.002 inches.
Maximal Height of Barometer (11th, at 9 a.m.),	30.334 ,,
Minimal Height of Barometer (26th at 9 a.m.),	29.172 ,,
Mean Dry-bulb Temperature, - - -	58.7°.
Mean Wet-bulb Temperature, - - -	55.4°.
Mean Dew-point Temperature, - -	52.4°.
Mean Elastic Force (Tension) of Aqueous Vapour,	.396 inch.
Mean Humidity, - - - -	80.1 per cent.
Highest Temperature in Shade (on 16th), -	74.2°.
Lowest Temperature in Shade (on 31st), -	41.7°.
Lowest Temperature on Grass (Radiation) (31st),	37.9°.
Mean Amount of Cloud, - - -	53.9 per cent.
Rainfall (on 16 days), - - - -	2.285 inches.
Greatest Daily Rainfall (on 28th), - -	0.448 inch.
General Directions of Wind, -	W., N.W., W.N.W., W.S.W.

Remarks.

August was a fine and generally summerlike month, the mean temperature exceeding that of July by 2.7°. Had it not been for a decided cold snap and heavy rainfall in the last week or ten days the month would probably have established a record for warmth and dryness. The mean temperature of the three weeks ended Saturday the 23rd was 62.2°; that of the week ended the 16th rose to 64.6°, while that of the week ended the 30th fell away to 54.0°. The mean temperature of both the 30th and 31st was as low as 50.0°. But Thursday the 28th was the coldest, as it was also the wettest, day of the month—the temperature of that day was 49.8°, and the rainfall exceeded an inch at the County Wicklow stations. The low thermometer readings and the heavy rainfall of that day were connected with the passage of a deep atmospheric depression across England in a north-easterly direction from Cornwall to Yorkshire. In Ireland the wind backed from E. through N.E. and N. to N.W. as the disturbance passed.

Great heat was experienced in the South of England and in France during the first half of the month. In England the thermometer rose day after day to 80° at many stations;

while in France maximal readings of 90° and upwards were frequently reported.

In Dublin the arithmetical mean temperature (60.4°) was 0.8° above the average (59.6°). The mean of the dry-bulb readings at 9 a.m. and 9 p.m. was 58.7°. The mean maximal temperature was 66.7°; the mean minimum was 54.0°. In the fifty years ending with 1915 August was coldest in 1912 (M.T. = 54.4°), and in 1881 (M.T. = 57.0°), and warmest in 1899 (M.T. = 63.4°). In 1911 the M.T. was 63.2°. In 1916 it was 62.3°; in 1917 it was 59.6°, and in 1918 it was 61.2°.

The mean height of the barometer was 30.002 inches, or 0.105 inch above the corrected average value for August—namely, 29.897 inches. The mercury read 30.334 inches at 9 a.m. of the 11th, and fell to 29.172 inches at 9 a.m. of the 26th. The observed range of atmospheric pressure was, therefore, 1.162 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 58.7°. It was 1.6° above the value for July, 1919. Using the formula, *Mean Temp.* = *Min.* + (*Max.* — *Min.*) × .47, the mean temperature was 60.0°, or 0.8° over the average mean temperature for August, calculated in the same way, in the thirty-five years 1881 to 1915, inclusive (59.2°). The arithmetical mean of the maximal and minimal readings was 60.4°, compared with a thirty-five years' average of 59.6°. On the 16th the thermometer in the screen rose to 74.2°—wind, W.; on the 31st the screened thermometer fell to 41.7°—wind, W. by N. The minimum on the grass was 37.9° on the 31st.

The rainfall was 2.285 inches on 16 days. The average fall for August in the thirty-five years, 1881–1915, inclusive, was 3.040 inches, and the average number of rain-days was 17. The rainfall, therefore, was considerably below and the rain-days were slightly under the average. In August, 1884, only 0.777 inch was measured on 6 days. Up to the year 1917, August, 1905, had held the record for rainfall in this month in Dublin, for the measurement was 7.019 inches on 22 days, 3.436 inches having fallen on the 25th. But August, 1917, had a record fall of 7.577 inches on 24 days.

Fresh winds were noted on 11 days, but never attained the force of a gale (8). Temperature reached or exceeded 70° in the screen on 10 days, and on 6 days it fell below 50°. A solar halo

was seen on the 29th ; a lunar corona on the 13th. Thunder was heard on the 25th.

The rainfall in Dublin during the eight months ending August 31st amounted to 15.310 inches on 133 days, compared with 14.530 inches on 118 days in 1918, 20.892 inches on 124 days in 1917, 22.031 inches on 152 days in 1916, 19.265 inches on 134 days in 1915, 14.467 inches on 131 days in 1914 ; only 9.455 inches on 96 days during the same period in 1887, and a thirty-five years' average (1881–1915) of 17.620 inches on 130 days.

At the Normal Climatological Station in Trinity College, Dublin, the observer, Mr. A. W. Boyce, reports that the mean height of the barometer was 30.015 inches, the range of atmospheric pressure being from 30.309 inches at 9 a.m. of the 11th to 29.210 inches at 9 a.m. of the 26th. The mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 60.5°. The arithmetical mean of the daily maximal and minimal temperatures was 60.9°, the mean maximum being 68.3° and the mean minimum 53.4°. The screened thermometers rose to 77° on the 15th and fell to 44° on the 30th. On the 31st the grass minimum was 34°. Rain fell on 16 days to the amount of 2.393 inches, the greatest fall in 24 hours being 0.630 inch on the 25th. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 160.1 hours, of which 12.0 hours occurred on the 7th. The mean daily duration was 5.2 hours. The mean sub-soil temperatures at 9 a.m. were—at 1 ft., 61.1° ; at 4 ft., 57.8°

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other data :— Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin ; Mr. T. Bateman, Malahide, Co. Dublin ; Mr. J. Pilkington, Stirling, Clonee, Co. Meath ; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin ; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin ; Mr. F. Dudley Joynt, Donnybrook, Dublin ; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin ; Dr. Arthur S. Goff, Dundrum Castle, Co. Dublin ; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin ; Miss Armstrong,

Rathdown House, Greystones, Co. Wicklow; Miss Maude Moore, Blairfinde, Greystones; Dr. C. Denys Hanan, M.D., Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

ARDGILLAN.—Rainfall, 2.33 inches on 13 days. Average, 3.49 inches on 17 days. Maximum in 24 hours, 0.66 inch on 25th. Rainfall since January 1, 15.02 inches on 134 days. Average, 18.84 inches on 125 days.

MALAHIDE.—Rainfall, 1.98 inches on 13 days. Maximum, 0.40 inch on 25th.

CLONEE.—Rainfall, 2.42 inches on 16 days. Maximum, 0.60 inch on 25th. Rainfall since January 1, 18.07 inches on 136 days.

PHŒNIX PARK.—Rainfall, 2.218 inches on 16 days. Maximum, 0.414 inch on the 25th. Bright sunshine, 183.5 hours, including 12.8 hours on the 7th.

CHEEVERSTOWN.—Rainfall, 2.56 inches on 18 days. Maximum, 0.56 inch on 28th. Thunder occurred on the 25th.

DONNYBROOK.—Rainfall, 1.700 inches, on 9 days. Maximum, 0.510 inch on the 28th. Rainfall since January 1, 14.140 inches on 115 days.

RANELAGH.—

Mean corrected Height of Barometer, -	30.001 inches.
Highest corrected Reading (11th, 9 hours),	30.32 ,,
Lowest corrected Reading (26th, 9 hours), -	29.18 ,,
Mean Dry-bulb Temperature, - -	59.3°.
Mean Wet-bulb Temperature, - -	56.1°.
Mean Vapour Pressure, - - -	0.408 inch.
Mean Humidity, - - - -	81 per cent.
Mean Maximal Temperature, - - -	68.8°.
Mean Minimal Temperature, - - -	52.7°.
Arithmetical Mean Temperature, - -	60.8°.
Highest Temperature in Screen (11th), -	78°.
Lowest Temperature in Screen (31st), - -	40°.
Lowest Temperature on Grass (31st), - -	29°.
Nights of Ground Frost, - - -	1
Rainfall (on 15 days), - - - -	2.14 inches.
Greatest Daily Rainfall (18th, 28th), -	0.45 inch.

Mean Amount of Cloud, - - -	62.1 per cent.
Days of Clear Sky, - - - -	3
Days of Overcast Sky, - - -	11
General Directions of Wind - -	N.W., S.W., W.S.W.

Remarks.—The first twelve days were mostly dry and warm; after that the weather was unsettled, with a cold spell towards the close of the month.

DUNDRUM.—Rainfall, 2.59 inches on 14 days. Maximum, 0.59 inch on 28th. Mean shade temperature, 60.0°; highest, 74° on 15th; lowest 44° on 31st.

KILLINEY.—Rainfall, 2.07 inches on 10 days. Maximum, 0.62 inch on 28th. Average (24 years), 3.212 inches on 17 days.

GREYSTONES (RATHDOWN HOUSE).—Rainfall, 2.78 inches on 10 days. Maximum, 1.02 inches on 28th. Max. temp. 80° on 13th. Min. temp., 45° on 29th and 30th. Distant thunder on 15th.

GREYSTONES (BLAIRFINDE).—Rainfall, 2.26 inches on 6 days. Maximum, 1.02 inches on 28th.

NEWCASTLE, CO. WICKLOW.—Rainfall, 2.86 inches on 9 days. Maximum, 1.03 inches on 28th. Mean temperature, 60.0°; maximum, 77° on 17th; minimum, 43° on 31st; mean maximum, 67.8°; mean minimum, 52.2°.

ENNISTYMON.—Rainfall, 3.34 inches on 17 days. Maximum, 0.81 inch on 31st.

CASTLECONNELL.—Rainfall, 3.09 inches on 16 days. Maximum, 0.49 inch on 31st.

DUNMANWAY.—Rainfall, 3.86 inches on 14 days. Maximum, 0.88 inch on 1st. On the 27th, 0.70 inch fell, and on the 28th 0.58 inch. There was no rain from 4th to 12th, and only 0.09 inch fell during the first 16 days, which were very hot, especially the 5th and 7th. Heavy rain on the nights of the 17th and 18th cooled the atmosphere, but it was still warmer than usual. Most of the rain fell at night, except on the 28th and 30th, which were the only wet days. Stormy on the 17th and 26th.

PERISCOPE.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about Two Hundred and Fifty Dollars, will be made on July 14, 1920, provided that an Essay deemed by the Committee of Award to be worthy of the Prize shall have been offered. Essays intended for competition may be upon any subject in Medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College, Francis R. Packard, 19 South 22nd Street, Philadelphia, Pa., U.S.A., on or before May 1, 1920. Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. No Alvarenga Prize for 1919 was awarded.

LONDON MEDICAL EXHIBITION, SEPTEMBER, 1919.

The exhibit of Messrs. Burroughs, Wellcome & Co. was very comprehensive and served admirably to indicate the vast range of this Firm's activities. It was so arranged as to be extremely convenient to the busy medical visitor interested specially in certain phases of Medicine. For instance, all practitioners interested in the modern treatment of venereal disease (and who is not, now-a-days?) had presented to them in a group not only "Kharsivan" and "Neokharsivan," the first British products to replace German salvarsan and neosalvarsan, but also the "Wellcome" mercurial creams for intramuscular injection, as well as a wide range of "Tabloid" and "Soloid" products covering practically the whole materia medica of venereal treatment. Similar displays contained the range of "Tabloid" and "Wellcome" Brand products presenting Cascara Sagrada, in regard to the quality of which the firm has a special reputation. "Soloid" products for nasal and naso-pharyngeal use formed another and

similar group, as also did the "Wellcome" Brand Serums, Vaccines and Tuberculins and "Tabloid" Animal Substances. A special "Lubafax" exhibit appealed particularly to surgeons because it demonstrated in a practical manner that this first-class surgical lubricant could be removed from instruments, catheters, &c., with a damp sponge owing to its solubility in water and its non-greasy character. An optical demonstration of the correct viscosity of liquid paraffin for use as an intestinal lubricant was made by means of "Paroleine" as compared with two other products, the viscosities of which were above and below the correct standard. Similarly there were ocular demonstrations of the value of "Infundin" for producing a powerful and lasting rise of blood pressure and for increasing the strength and frequency of labour pains. A graphic chart showed the low dosage of "Iodicin" as compared with potassium iodide by reason of its high content of organic iodine in a state of high therapeutic activity.

NATIONALISATION OF HEALTH IN QUEENSLAND.

A DEPUTATION of representatives of the Australian Natives' Association waited on the Acting Premier of Queensland recently and placed before him certain proposals for the nationalisation of the medical, nursing, and ambulance services for the State, together with State control of all hospitals, sanatoriums, and other agencies associated with the public health. Mr. Theodore said he gathered that the deputation asked for the complete nationalisation of all hospitals and similar institutions, and that all physicians, surgeons, medical specialists, dentists, oculists, chemists, nurses, midwives, ambulance bearers, and others associated with the public health should become public servants. That was a pretty large order. Certain phases of the public health in all the States were under national control, but an extension in the manner indicated would meet with tremendous opposition. He did not think it would be practical to make every doctor and specialist a public servant. The carrying out of such a proposal would cost an enormous sum of money. The nationalisation of the hospitals alone would cost £250,000 more than was already spent on hospitals. That aspect of the proposal, however, would be seriously considered by the Government.

THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

NOVEMBER, 1919.

PART I.

ORIGINAL COMMUNICATIONS.

ART. X.—*The Teaching of Pathology.*[a] By THOMAS T. O'FARRELL, F.R.C.S.I., D.P.H.; President Section of Pathology, R.A.M.I.; First Assistant in Pathology, Univ. Coll., Dublin, N.U.I.; Pathologist to St. Vincent's Hospital, &c.

LADIES AND GENTLEMEN—My first duty is to express my profound appreciation of the great honour you have conferred upon me by electing me to the Presidency of the Section of Pathology.

Although I have been a Fellow of the Academy for a number of years, and have attended very many meetings, I have always looked upon the President with a certain amount of awe and an unlimited amount of respect.

Consequently, when I now find myself in that position, I am at a loss to express my feelings in the matter.

The one encouraging thought, however, is that I have always regarded the Royal Academy of Medicine in Ireland as our post-graduate school where we are all students. As in our early school-days, not only do we gain a large amount of information, but we also come to know each other. In this Academy we are drawn together in such a manner as to waken and confirm friendships which we might otherwise have missed.

[a] Inaugural Address delivered before the Section of Pathology, Royal Academy of Medicine in Ireland, October 31st, 1919. [For the discussion on this Address see page 215].

With this reassuring consideration, therefore, I address you on this occasion.

As the subject of educational reform has recently been a source of fruitful discussion in many teaching centres, it occurred to me that a consideration of the present position of the teaching of pathology and bacteriology might be a profitable one, and might prove of interest to the section.

The Irish School of Teaching and the Science of Medicine have been handed down to us from long ages past.

So far back as the seventh century diseases such as small-pox were described in the Irish monastery records, and we know from O'Curry that at that time one-third part of the great seat of education at Armagh was appropriated to foreign students.

Our ancient annalists have left us records of the various epidemic pestilences which broke upon our land, an account of which has been so ably put together in the Census of 1851.

It was in the work of the eighteenth century, however, that the Irish Medical School laid rungs in the ladder of Medical Science, and showed itself to be in touch with contemporary advance in other countries. At that time, owing to the teaching and influence of Sir Fielding Ould, the male midwife came into fashion, a change which was being advocated by Smellie and William Hunter in London, and by Röderer, Böer, and others on the Continent.

That century saw the foundation of many hospitals in Ireland—namely, in Cork, Limerick, Belfast and Dublin. In Dublin, Jervis Street, Steevens', Mercer's and the Meath were established.

The subject of immunisation against small-pox was, in those pre-antigen days, dealt with in a paper by Dr. Rutty, whose observations will be found in the manuscript annals of the Medical and Philosophical Memoirs of 1757. Even before this time several Dublin writers showed themselves to be in touch with Continental work on "Inoculating the Small-pox." What has now come to be regarded as the Dublin method for delivering the placenta was largely due to the writings of Foster, Dease, Clarke, Collins, McClintock and Hardy, from 1781 to 1848.

At the beginning of the following (19th) century the Dublin school came into prominence. Its founders were John Cheyne, who described acute hydrocephalus and Cheyne-Stokes respiration; Abraham Colles, who stated "Colles's law"; and Robert Adams, who left classic accounts of essential heart-block and rheumatic gout. Other important members were Corrigan, of Corrigan's pulse, and William Wallace. The outstanding members were Robert Graves and William Stokes, whose names are so familiar to us.

The Dublin medical societies were very active at that period. There was the Association of Fellows and Members of the King's and Queen's Colleges of Physicians, the Surgical, Obstetrical and Pathological Societies. The Pathological Society was founded in 1838, and continued up to 1882, when it came to be amalgamated with the other societies under the title "The Academy of Medicine in Ireland," of which Academy we are the honoured Fellows and Members.

Many familiar names are to be found in the "Proceedings of the Pathological Society," and not a few of the specimens which were carefully recorded by these energetic men are still to be found in our Pathological Museums.

Concerning the work of more recent times, I have to refer you to those admirable chronicles which are the product of the facile pens of Cameron and Kirkpatrick.

In this short record of the achievements of the Irish school there is sufficient incentive to urge us to advance the cause of Medical Science and to keep up its teaching traditions. I hope that any observations I may make will be regarded in this spirit, and that constructive criticism will be the keynote of the discussion.

The Student.

Before considering the teaching of Pathology and Bacteriology, it might be well to consider the student we have to teach. It is probable that there is very little difference from year to year in the type of student who comes to any Medical School or Hospital. But one thing which has struck me forcibly in recent times is that, notwith-

standing the large numbers who have now chosen the medical career, by far the greater majority are sound workers and enthusiastic students.

In Pathology we have to deal with men in their third and fourth years. "Wasters" have been already weeded out in the earlier subjects, so that, so far as Pathology is concerned, the days of the "chronic" are over, and he may be regarded now as being defunct as the dodo.

This may also be explained by the fact that parents come to realise more quickly than heretofore that their son is not suited to the medical profession, and put him to some other work.

Whatever the cause may be, I think it may be granted that the average student is an attentive and industrious man.

As is natural, the primary object of the student is to obtain his qualification, and, notwithstanding the abuse which has been levelled at examinations, these are the tests which have been set up to determine whether he is fit for qualification or not.

I for one am not averse to the system of examinations, because I consider that, no matter how far they fail in being a true test of proficiency, they are an incentive to work, and they direct the student along the course he is expected to travel.

Now, we must remember that the student is recommended to read certain books, and we must understand that he may naturally resent a question upon recent work which has not yet found its way into the text-books.

The teacher must keep in mind the words of Pope,

"Just as the twig is bent, the tree 's inclined."

If I may lay a little stress on this subject, I would take the liberty of stating how this matter has come home to me.

The Dublin student, at any rate, has set up a certain standard for a teacher, and this is expressed by the statement, "he gives good value," or, "he does not give good value." For the purpose of the present argument, I am not going to consider the teacher who is a past master of his art; a man whose very presence, facility of diction, and enthusiastic exposition are in themselves an attraction to any type of student. We are happy in this

country in having many such teachers in our schools and hospitals.

The true meaning of "good value" and "not good value," as I interpret it, depends upon whether the teacher confines himself to the subjects of the examination or not. So much so is this the case, that even the Master of his Art, alluded to above, may be described as "he is a very interesting, but it (the subject) will not be asked." In other words, if a teacher deviates from the standard text-book, say to give a discourse on recent work, his teaching will not be popular.

This condition of affairs is not satisfactory, because it kills the spirit of advance.

Current Medical Journals.

Examinations will always be with us. They will probably, at some future date, be modified by the addition of marks given for "work done during the term." In the meantime, can any change be made whereby the spirit of advance may be fostered? In my opinion, one immediate improvement can be effected.

At the beginning of the term, when it is the custom of most teachers to recommend certain text-books which will form the basis of the student's study, I think the teacher should also accompany his advice with a recommendation to read a current medical journal. If possible, an arrangement should be made whereby a question should be put at the examination on the subject matter relating to the work in hand, which has appeared in that journal. The advantages of this plan are manifold. The student will get the habit of reading current work, which will be of inestimable value to him after qualification, and will prevent him from falling into what Osler calls "the newspaper or novel habit."

It will direct his attention to the modification of ideas which modern work is bringing about, and will give him a living interest in the subjects he reads in his text-books. It will encourage him to bring problems to his teacher, and, at the same time, will react beneficially on that teacher. It will make the student a keen searcher after

truth. It will be an indication to him as to how research work is carried out, and will inspire him with ideas. Incidentally, it will waken in him an interest in the progress and future of his profession, and will bring before him important subjects such as questions of Medical Ethics. He will feel that he is already a member of an honourable profession.

It would be impossible to enumerate all the advantages in the time at my disposal, but I think they are apparent to any experienced teacher.

Two objections may be brought forward.

One is the question of expense. This does not arise, as the journals of the kind referred to are easy of access in our libraries. But even on the score of expense, I think it would fully repay the student to actually subscribe to a journal, and have it sent to his house. In support of this I would refer you to "The Residency" of any hospital where the house surgeon receives a weekly journal. It is remarkable to see the avidity with which the wrapper is undone, and the contents of the journal are perused.

The other objection is, perhaps, a more serious one—namely, that articles in journals are only the opinion of individuals, and are not necessarily orthodox. This is true to a certain extent. It would appear to me, however, that a reading of original ideas would act as an incentive to the looking up of the orthodox teaching on the subject, and would lead to useful discussions.

As the student looks to his teacher, and indirectly to his examiner, for advice, I think the journal should be a selected one, and the student ought to be notified that a question arising out of articles in numbers of the current year will be asked at the examination. To prevent undue hardship at first, I should consider the answering of such a question as not essential for a pass man, but I certainly would give additional marks for a knowledge of current literature in the case of honours.

This idea is not new, and it has been brought with success into many D.P.H. examinations.

Relation of Pathology to Clinical Work.

In studying the accounts of recent discussions upon

teaching outside Ireland, one gets the impression that in some places there is a well-grounded fear that the teaching of pathology has become too detached from its proper clinical application, and that the subject has become more of academic interest than of practical value to the student, who ultimately intends to engage in general practice. This opinion, so far, has not gained much ground in this country, largely, I think, because the teachers of pathology in our medical schools, in the majority of instances, are also pathologists to clinical hospitals; consequently, the natural tendency of the teaching is to make the work in the medical school largely conform to hospital requirements. There are, however, certain conditions which predispose to the want of co-ordination between the clinical and pathological teaching.

In the first place, the attendance of clinicians at the meetings of our Section is, on the whole, not good. This would lead one to think that pathology has no attractions for them.

In the second place, I think that the time has come when the position of the Hospital Pathologist should be reconsidered.

With regard to the remarks I have to make on the position of the Hospital Pathologist, I wish it to be understood that I am not alluding to any hospital in particular, and, above all, not to the one to which I have the honour to be attached.

In my own case, it would be both uncalled for and ungracious to say anything of a disparaging nature of a place where I have always met with the greatest consideration, assistance and encouragment. However, I think that if we, as pathologists, are to meet the future accusation of clinicians, that our students are not receiving the proper practical clinical turn in their teaching, we ought to now review our position.

We in Dublin have a comparatively large number of hospitals which do excellent work. The majority have pathologists and laboratories which are fitted out commensurate with the finances available. Our work has undergone a complete revolution in recent years. The

pure morbid anatomy of bygone days has been extraordinarily modified in the direction of clinical or live pathology; as an example, the preparation of vaccines, a purely therapeutic agent, has become a routine.

The position of the pathologist is, however, peculiar and antiquated. In the majority of instances he is not an official member of the teaching board of studies, that is to say, he is only unofficially consulted as to the arrangement of the curriculum. He has not the status which would enable him to give or receive advice on the general conduct of hospital teaching, and is excluded from giving any opinion as to the fitness of any candidate for appointment on the junior staff.

I wish to make it perfectly clear to any clinicians who are present, that I do not intend the pathologist to usurp the position of the clinical man.

The pathologist is indebted to the clinician for practically all his material—tumours removed by operation, puncture fluids and the like. It would be bad policy, if not bad taste, to interfere with him in any way, but I would like in all sincerity to recommend, in view of modern requirements, that the matter should be given consideration.

Improved Methods in the Teaching of Pathology.

In many centres, teaching methods are under consideration, both in these countries and in America. Many books have appeared on the subject. A recent general survey is to be found in "The Future of Medicine," by Sir James Mackenzie. To Sir George Newman we are indebted for two important memoranda, one on "Medical Education" (1918), and the other on "Preventive Medicine" (1919).

A monumental work has recently been published by the Edinburgh Pathological Club. The opinions of various experienced teachers in all branches of Medicine were asked, and a report embodying their recommendations was drawn up and published in book form. A careful perusal of this work will fully repay anyone who is concerned in the teaching of medicine.

As regards pathology and bacteriology the following recommendations appear to me to be important.

1. Formal lectures should be retained, as they indicate to the student the course he should follow.

2. The modern view, that pathology is a study of the living as well as of the dead, should be reflected in the teaching.

It is recommended that the lines upon which they may be best achieved should be :—

Firstly, the teaching of clinical pathology—*i.e.*, the collection of material, methods of examination, and the interpretation of the findings.

Secondly, the student should be taught "the Unity of Disease." He should be given an opportunity of following up cases from beginning to end. He should be instructed to correlate clinical signs and symptoms during life with the conditions found after death.

Thirdly, pathological clerkships should be established in all hospitals.

3. Round-table conferences should be held from time to time between the clinical teacher and the teachers of pathology, and so co-ordinate the two subjects.

Before considering improvements in our own methods it might be well to review how far we have already progressed in the above respects. Although I cannot claim to be conversant with the full details of every Dublin teaching college, I have an idea as to the general outline of the work done.

As regards the teaching of clinical pathology, one college has established a Practical Pathology Class for fourth year men. This includes the collection of material, the various methods of examination, and the interpretation of results; the consideration of the diagnosis of certain diseases such as diphtheria, typhoid and syphilis. In another college, great attention is paid to *post-mortem* work. The student is required to write a full account of his six cases. In some hospitals pathological clerks have been appointed.

Without burthening you with too much detail, I should like to draw your attention to the teaching of Prof.

Lorraine Smith and the method he has adopted for the study of autopsies.

The student is required to work out a report on the pathology of six cases. He is supplied with the details of the clinical record; he makes notes of the *post-mortem* examination, and gives a description of the appearances of the affected organs in each case. He is also required to investigate these tissues microscopically. After this he writes a summary or review dealing with all the points of pathological interest which a study of the case reveals. In short, he is required to write a report on the case as complete as he can make it. The report and slides are examined by the staff, and marks are allowed which are included in the total which determines the class honours. It is claimed for this method that the student grasps the unity of disease from the first—a claim which, I think, is well justified. This method has one possible drawback. As the student is provided with the clinical records of the case, it is quite possible that he may not have seen the case during life, and thus cannot carry the visual impression of the clinical condition, in such a vivid way, as he would do, if he had seen the case alive. No written account of a person dying of pneumonia could impress a student as much as an actual view of the case. Having seen the patient it will give him a very live understanding of the significance of the pathological findings at autopsy. In addition to keep the idea of "live" pathology uppermost, I should be inclined to enlarge the scope of the reports. The above method presupposes the death of the patient. I think the student should also be required to furnish an account of a live case in which pathological examinations had been made, or in which tissues, removed by operation, had been examined.

A description of such a case might be given as an alternative, or as an addition to the account of the *post-mortem* results.

In my own experience, the material available from operations and "live" cases is far greater than that obtainable from autopsies, so that there would be little difficulty in providing the student with the necessary means of drawing up such reports. Take, for example, a

case of Hodgkin's disease. We first have the clinical history, the differential diagnosis, blood examination—a gland removed for examination, &c. Or, again, a case of typhoid : a consideration of the source of infection, clinical history, signs and symptoms. The examination of the blood, fæces, and urine.

The only point of importance would be as to when an account of these "live" cases should be undertaken. Personally, I think that it might be undertaken by the fifth-year man. On account of his work in the fourth year he will have a good ground work of clinical pathology; being a senior man he will be in a better position to understand the clinical findings, and it will have the effect of keeping before his mind, up to the time of qualification, the useful application of pathological methods to the actual practice of medicine. An instructive feature might be added to these reports if the student who composed them submitted his results as a paper before a students' medical society. It would supply material for the Society, ensure that the work of the society was done by students, and be an example to junior members.

Before leaving this part of the subject I should like to draw your attention to the fact that an enormous amount of material for the teaching of morbid anatomy is not at present made available. I refer to the source of supply which is present in the union hospitals, hospitals for incurables, asylums and such like institutions. When the whole question of the teaching of pathology comes to be considered by the various colleges, an attempt should be made to secure an addition to their material from these sources.

Specialisation.

With regard to the American investigations into the problems of teaching, much the same points as those already discussed have come up for consideration, but in addition more stress has been laid upon the modern tendency to specialisation.

Now, I think that this is a subject which we ought to consider. Partly owing to the number and the independent working of our hospitals there is a tendency for many of our

students to take up special work after qualification. That which prompts them to specialisation is, in the first place, they like the work, and, in the second place, they see an opening in that particular field, each hospital requiring various specialists.

In the majority of instances they have at first to take all kinds of work, but they gradually confine themselves to their specialty. As to their special qualifications, this is usually the outcome of post-graduate work done in preparation for certain examinations, such as fellowships, memberships, diplomas, or baccalaureates. If they have sufficient means they may go abroad, and do a special course of study in their specialty.

The experience of one writer in America, Harris, speaking of the School of Otolaryngology, Camp Greenleaf, Georgia (where a course of instruction was organised for specialisation), gives a very gloomy opinion as to the qualification of specialists from our point of view. He says that "although they were men who had practised the specialty for a number of years, with few exceptions, they showed a woeful want of knowledge of its fundamentals—pathology and bacteriology did not enter into their field of knowledge."

I do not mean to imply that similar conditions apply here, but I think that, so far as we are concerned, the student ought to have certain opportunities for realising that our subjects are essential for specialisation work after qualification.

When the ordinary curriculum has been improved, a good deal will be done towards that end, but I think that facilities should be obtained for the laying down of a sound scientific foundation for future specialisation. There are already, in one of our medical schools, special classes given in immunology and the diseases of ductless glands. The giving of special classes, however, in the subjects of say, gynaecological pathology, pathology of the skin, &c., would throw too much work upon the ordinary teaching staff of a medical school, but if these classes were conducted by extra-mural teachers, much benefit would accrue,

I would suggest that men with special qualifications, though not on the teaching staff of the school (possibly belonging to another college) should, after consultation with the director, give five or more lectures or classes on his particular specialty. All the pathological material available in the laboratory should be placed at his disposal. The fees would not weigh heavily upon the college, and the course would be of mutual benefit to the students of the school and to the individual giving the lectures. The position might be held for three years, or less, according as experience dictated.

I would be inclined not to make the courses compulsory. This would have the effect of diminishing the number of the class (an advantage) and would assist the student to determine whether he felt himself fitted to take up the specialisation at a future date. That the classes would be attractive I have no doubt, as the introduction of new life, personality, and methods, always brings a sense of novelty into teaching work.

The details of these classes could be arrived at only after a careful consultation of the teachers concerned. The classes might consist of a complete course or a limited one on the application of pathological methods in the particular specialty.

For example, under "Gynæcological Pathology," discourses or practical classes might be given on uterine scrapings and their diagnosis, the bacteriology of puerperal fever, morbid conditions connected with pregnancy. Under surgical pathology suppuration or tumours of bone, enlargement of the thyroid gland, might form suitable subjects. Under medical pathology, a dissertation on the ætiology of pneumonia, the examination of puncture fluids, the pathology of rheumatic conditions, might prove valuable. Barry, in his review of the French medical curriculum, does not speak with great encouragement of the attendance at voluntary lectures, but I think that one would be sure to get the keen student, the student who intends to specialise, the Honours man, the B.Sc. man, and hospital residents, particularly those from special hospitals.

It is not unlikely if the courses were open to medical men that not a few would attend.

I am convinced that the matter is worthy of consideration and trial.

CONCLUSIONS.

To summarise my conclusions, they are these :—

1. The modern student is anxious to comply with the regulations laid down for his guidance.

2. The examinations and the teaching should be so modified as to conform to modern ideas. The reading of a current medical journal should be part of the programme.

3. In view of the close association of pathology with clinical work, the hospital pathologist should be in a position to discuss teaching methods on the same footing as clinicians.

4. Round-table conferences should be held from time to time of all teachers in medical subjects.

5. The following alterations are suggested in the curriculum :—

(a) The third year men to receive the ordinary courses in general and special pathology, bacteriology and practical work.

(b) The fourth year men to attend a practical course in clinical pathology. They shall also be required to report upon six autopsy cases, having, if possible, ascertained the clinical history for themselves, otherwise to have the history provided. The results of the *post-mortem*, together with histological findings and other data to be drawn up as a report. Marks to be given which should be included in the totals at examinations.

(c) The fifth year men to report on a given number of "live" cases, giving the clinical findings and detailing the clinical pathological methods. In surgical cases an account to be given of the histological findings in tissue removed by operation. The students to be encouraged to bring their work before students' medical societies.

6. A system of lectures, demonstrations or classes in practical work to be instituted in specialised subjects. These to be conducted by extra-mural teachers in consultation with the director of the department.

In bringing my discourse to a close I have to thank you for listening with such patience. In my anxiety to emphasise certain points, I am afraid I may have given you the impression that I wish to make an overwhelming addition to the already overburthened course of the medical student. Such, however, is not the case. So far as the Irish school is concerned my suggestions are rather a modification of the existing conditions than any actually new additions.

There are some other points which I would like to have touched upon; for example, the advisableness of relegating parasitology to the zoologist, and a consideration of post-graduate teaching, but as I have already taken up a considerable amount of your time I shall have to omit them.

As I believe it is the prerogative of a President to invite discussion—I do so now. I am particularly anxious to hear the opinions of clinical teachers, who, under present conditions, are responsible for the teaching of the student when he has passed from the hands of the pathologist. The clinician is able to judge what has been the effect of past methods, and he will probably have formed very definite opinions on the matter.

I know your criticism will be in the interest of the advancement of the teaching of pathology, and if any of the criticism be adverse I will remember the words of Bacon, "The best preservative to keep the mind in health is the faithful admonition of a friend."

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ART. XI.—*The Ductless Glands.*[a] By CAPTAIN GEORGE HALL DAVIS, B.A., Dublin University.

(*Continued from page* 149).

WHATEVER opinion scientists may hold with regard to the efficiency of extracts as a method of research, they cannot deny that in certain pathological conditions their administration is beneficial, and in some cases specific. The idea of administering extracts as a curative measure is no new development. In the healing arts of primitive people as well as in the earlier periods of scientific medicine, remedies were employed and measures resorted to which are the direct forerunners of the organo-therapy of to-day. The study of the efficacy of various organs as remedial agents arose in the time of Hippocrates, and Celsus and Dioscorides recommended the use of various animal organs for the relief of those symptoms in man which were considered to be due to defective action of the same organ. Hence the use of pigeon's or wolf's liver in the case of hepatic disease, the brain of the hare for tremors, the lung of the fox for

[a] Read before the Dublin University Biological Association in the Session of 1918-1919.

dyspnœa, and the use of rennet for disorders of the stomach and intestines. Pliny recommended the use of the testicles of the donkey and of the stag as aphrodisiacs, and even now in certain places the practice remains of employing castoreum for menstrual disorders. Although one may be inclined to scoff at these seemingly crude attempts at treatment, we must realise that, in spite of the vague ideas that prompted them, they were carried out in the spirit which animates the humoral pathology of to-day, for it was realised that each organ plays a part in maintaining the balance of secretion, and thus has an influence on the organism as a whole.

The theoretical basis for organo-therapy and its practical value have varied very considerably at different times. Some flagrant examples of the uncritical application of this method are the treatment of cardiac disease by extracts of the heart muscle, subcutaneous injections of extracts of the ciliary bodies for iritis, and of synovial membranes in the diseases of joints. Now, however, organo-therapy holds a recognised place amongst the curative methods of modern science, and I propose to give a short summary of the diseases in which it is claimed to be efficient. A proper systematic study of the diseases which are benefited by the exhibition of extracts is altogether beyond the scope of a paper such as this, and I hope my audience will bear patiently with this very cursory account of some of the fairly firmly-established uses of these extracts.

There are three methods of administering extracts clinically :—

1. By the mouth.
2. By intramuscular injection.
3 By intravenous injection.

The first is much the simplest, but also the least satisfactory. No extract except that of thyroid gland is absorbed unaltered from the alimentary canal, and, therefore, as a general rule, intramuscular and intravenous injection are the more satisfactory methods of administration. If an immediate result is desired, intravenous injection should always be employed.

The pathological conditions which we would expect the extracts of the glands to relieve most readily are those arising in the glands themselves. Disease of a ductless gland may affect it in three ways: it may cause too much secretion, too little secretion, or perverted secretion, in which last case abnormal substances are formed instead of the usual active principles of the gland. One would expect that, where the secretion of the gland is deficient, and possibly where it is perverted, exhibition of the extract of that gland would be beneficial; and it is disappointing to have to state that only in the case of thyroid insufficiency has organo-therapy proved of any value. Myxœdema responds in a most striking manner to the administrations of thyroid extract, but neither Addison's disease nor any of the pathological states of the pituitary body gain similar benefit from administration of their respective extracts.

What, then, gives thyroid extract such superior properties to the other glandular extracts? Possibly, it is the fact that it is absorbed unaltered from the alimentary canal. Adrenalin, we know, is not absorbed from the alimentary canal, since its constricting influence on the vessels of the villi hinders its own absorption. Injection of adrenalin is a poor substitute for administration by the mouth, since it is impossible to give frequent enough injections. By injection we pass a fairly large quantity of adrenalin into the blood, and expect it to carry on its physiological function until the next injection is administered. But it has been proved that adrenalin is only active in an alkaline medium such as the blood for a very short time (about half-an-hour), and we could only expect to replace the deficiency of adrenal secretion by very frequent injections of small quantities of extract.

The student naturally thinks—If myxœdema is the only condition for which I can prescribe thyroid extract successfully, what is the use of remembering its presence in the B.P.? There are large numbers of cases of thyroid insufficiency which never reach the stage of myxœdema but which exhibit a widespread and puzzling symptom-complex, due to varying degrees of sub-thyroidism. These symptoms have been described by Dr. E. Hertoghe in his

article on "Thyroid Insufficiency" in *The Practitioner* of January, 1915, as follows:—Hypothermia, uncontrollable headache, rheumatoid pain and neuralgia, mental depression, dyspnœa, asthmatic attacks, premature greyness and baldness, dental caries. Surely the patient cured of such a train of symptoms would consider his doctor a veritable Æsculapius—a possessor of the long sought "Golden Remedy."

In children, also, many cases of retarded growth, obesity and deficient mentality are due to deficiency of thyroid secretion, and become absolutely cured when treated with thyroid extract.

In the treatment of cases of sub-thyroidism, the weighing machine is of great value in the estimation of the improvement of the patient, and most cases lose their superfluous flesh and regain their lost energy with pleasing rapidity.

In dealing with cases of deficiency of internal secretion it is of great importance to realise the inter-relationship between the various members of the endocrine system, for it is often found that a patient exhibits symptoms which cannot be wholly explained by disease of one single gland, but which are present when several of the endocrine organs are not functioning sufficiently. Such cases are known as pluri-glandular insufficiency, and respond well to treatment with mixed extracts, one of which, named polyglandin, is prepared by Allen and Hanbury, and contains thyroid, para-thyroid, ovary, testis, and pituitary, gland substances. At the same time it is difficult to see why ovarian and testicular substance should be necessary for one individual. Many preparations similar to that mentioned above are manufactured.

But it is not alone in pathological conditions of the endocrine organs that their extracts have proved of use. In every branch of Medicine they have been used with varying success, and the most pessimistic has to admit that some of the results obtained by their exhibition are very encouraging.

I propose to give a short account of the uses of glandular

extracts in General Medicine, in Obstetric Medicine, and in Diseases of the Skin. Any full account of the diseases in which these extracts have been *claimed* to give beneficial results would fill a large volume, but the number of cases in which their value is absolutely proven are scanty, and with these alone we will deal.

Adrenalin has been used with success as a styptic. Applied to a cut it causes local constriction of the arterioles and diminished blood supply to the cut surface. In ophthalmic operations derivatives of adrenalin painted on the conjunctiva have been found of great use in keeping the field of the operation free from blood. Adrenalin has also been used in conjunction with cocaïne for subcutaneous injection, and it has been found that the effect of these preparations is to increase and prolong the action of cocaïne.

When cocaïne is being applied to the mucous membrane of the nose adrenalin is of use, since, by causing vasoconstriction, it tends to limit the high power of absorption of the turbinate bones, and so reduces the danger of collapse. Langdon Brown advises the buccal administration of adrenalin where there is ulceration of and hæmorrhage from the small intestine. He claims beneficial results in cases of typhoid fever.

Adrenalin is of great service in relieving the actual spasms of asthma. Its effect, however, is only temporary, and it does not diminish the tendency to the attacks. Hypodermic injection is the most useful method of administration in these cases. It is claimed that in cases of pancreatic disease one or two drops of adrenalin chloride solution instilled into the eye will cause the pupil to dilate inside half-an-hour. This will not occur if the pancreas is healthy. Adrenalin has been frequently used in cases of collapse owing to shock, but it does not maintain as lasting an effect on the blood-pressure as pituitrin, which has largely replaced it in the treatment of shock. Pituitrin will maintain the blood-pressure for half-an-hour, and allow the vasomotor centre to recover. About 7 to 15 minims should be injected into a vein, and the dose repeated at 2-hourly intervals if necessary. The persistent

vomiting which sometimes occurs in Graves's Disease is often checked, and in some cases stopped, by injection of pituitary extract. In the administration of both pituitrin and adrenalin care must be exercised. Patients differ considerably in their susceptibility, and for the first dose more than 2 minims should not be given. Also, under certain conditions, the use of these two extracts is contra-indicated. Where the blood-pressure is high, administration of pituitrin or adrenalin will raise it further, and may cause cerebral hæmorrhage, especially if there is any disease of the arteries. In hæmoptysis adrenalin will cause further hæmorrhage, as its vaso-constricting action is not as strong on the pulmonary as on the general systemic circulation. Finally, in diabetic patients, administration of either adrenalin or pituitrin will increase glycosuria.

In Gynæcological and Obstetric Medicine internal secretions have been employed to a considerable extent. This is not surprising when we consider that the formation, development, and subsequent functioning of the genitalia are under the control of the endocrinic system.

Blair Bell considers that many cases of faulty development can be treated by endocrinic extracts. Cases are met with where all the characteristics of puberty are present except menstruation. These cases, if due to endocrinic insufficiency, almost always exhibit adiposity. The cases of incomplete development which may be improved are those of thyroid, pituitary and ovarian insufficiency. Ovarian insufficiency may be ignored, as it may be induced by either thyroid or pituitary deficiency. If the deficiency is in pituitary secretion, the skin is smooth and soft. If due to thyroid inadequacy, it is harsh and rough.

Exhibition of pituitary or thyroid extracts in the respective cases results in the onset of menstruation, but the use of the extract may have to be maintained for a long period.

Menorrhagia at puberty may in certain cases be due to excessive secretion of ovaries and thyroid. Many cases are due to imperfect harmony of the endocrinic secretions. If excess of either thyroid or ovarian secretion causes excessive menstruation, pituitary and suprarenal extracts

should be prescribed to counterbalance these excessive secretions. It must not be forgotten that there are many other causes of menorrhagia at puberty not directly connected with the endocrinic system, and these should be carefully investigated and excluded before resort is made to hormone therapy.

The menopause is brought about by cessation of ovarian functioning, and many disturbances may occur at this period. The hot flushes from which women suffer at this time are due to rapid alterations in the vasomotor control of the superficial vessels. These alterations may be abolished by administering infundibulin, which is prepared from the pituitary body, and which causes vasoconstriction of the superficial vessels. Adiposity may also ensue at this time in the life of a woman. It is due to an increased tolerance for carbohydrates, caused by thyroid or pituitary insufficiency, and may be successfully treated by administering the extracts of these glands. As the menopause changes occur fairly frequently in the thyroid, myxœdema is the most usual condition to arise, but exophthalmic goître may also ensue. These conditions must be appreciated, and receive early treatment. The mental depression which accompanies the menopause is found to be greatly relieved by thyroid administration.

During parturition, infundibulin increases the force and frequency of uterine contractions. It also assists retraction during the puerperium. It does not interfere with the effects of ergot, but rather augments them. It has been given in cases of uterine inertia during the second stages of labour, but great care has to be taken to make sure that the labour cannot be obstructed, and cases are on record where, even when these precautions have been taken, it has been found to cause tetanic instead of normal contraction of the uterus.

The chief use of pituitrin, however, is in postpartum hæmorrhage. The effect produced is more powerful and lasting than that of ergot, but the two drugs may be given together with very good effect.

We know that the endocrine organs have a profound influence on the condition of the skin. This is proved by

the changes which occur in the skin in certain pathological conditions of these glands. Endocrine extracts have been administered in many skin diseases—psoriasis, ichthyosis, eczema, scleroderma, tuberculosis of the skin have all been treated by means of thyroid, but only in the case of psoriasis has this treatment proved of any value.

There are on record a number of cases of psoriasis which have cleared up completely under the influence of thyroid extract apart from local treatment, or in which thyroid extract has given valuable assistance to local remedies by increasing the reaction of the skin.

A remarkable result of pituitary feeding, which, however, lies outside the realms of Medicine, has been recorded by L. H. Clarke in the "Journal of Biological Chemistry," of October, 1915. He experimented on laying hens. In the first experiment 35 white Leghorn hens as well as two cockerels of the same breed, with which they were mated, were selected. Each received daily during eight days the equivalent of 20 mg. of fresh pituitary substance, in addition to their usual food. By the fifth day the egg production had risen from an average of 18 *per diem* to 33. The beneficial effect, although diminishing, was maintained for several days after the pituitary substance had been taken off, and not only was the output of eggs largely increased as compared with the controls, but the fertility of the eggs and the hatching of the chicks was extraordinarily enhanced. In order to test the matter further, a second experiment was performed with as many as 655 one-year-old white Leghorn hens (kept without males), the same dose as before being administered to each hen during four days. The average daily number of eggs laid by the batch during the four days preceding the pituitary feeding was 233; during the four days succeeding the administration, 352! The fact that these experiments were made at a time of year when egg production of the hens was tending to diminish rather than increase is very remarkable.

In considering the functions of the ductless glands it is of great importance to realise their interdependence on one another. In the case of these organs, we are probably

dealing with a system as definite and co-ordinated as the digestive tract. Many examples and proofs of the close relationship between the members of the endocrinic system have already been quoted, but the following facts concerning the thyroid gland will further illustrate the close functional connection between these organs :—

The thyroid is influenced by the internal secretion of the generative glands. It becomes enlarged at puberty, during the menses, and during pregnancy. If the thyroid is removed, the generative glands are very slowly developed.

The internal secretion of the thyroid is also closely related to that of the pancreas. Thyroid feeding diminishes the limit for assimilation for sugar. This may be due to the thyroid extract causing increased secretion of adrenalin, or to a direct inhibitory action of the thyroid on the pancreas.

The thyroid secretion has a marked effect on the suprarenals. This effect is in the direction of increasing the excitability of those tissues amenable to the action of adrenalin. Also, when the thyroid is removed, the activity of the adrenals is diminished. Further, it is considered probable by many that the hyper-secretion of the thyroid in Graves's Disease causes the suprarenals to yield more adrenalin to the blood, and some writers attribute certain symptoms of Graves's Disease to this excessive secretion of the adrenals. Nor is the pituitary body unaffected by changes occurring in the thyroid. Removal or atrophy of the thyroid causes the pituitary to undergo general enlargement, and to show well-marked signs of increased secretion, hyaline masses having been observed in the pars intermedia of the pituitary in cases of thyroidectomy.

In many cases of exophthalmic goître it is found that the thymus is persistent : this would suggest some interrelationship between these two glands.

The foregoing facts seem to prove fairly conclusively that in the case of the endocrine organs, we are dealing with a functional unit, created in all probability to serve a definite purpose. Do we know what that purpose is? Speaking broadly, we may say that the endocrinic glands govern the chemical changes of nutrition and growth.

The reproductive glands produce germ-cells, but they also produce and pass into the blood a substance which ensures that the germ-cells may become mature and fertilised. This substance carries out this function by ensuring the development of secondary sexual characteristics, which are necessary for the fertilisation and further growth of the potential ovum. Nor is it solely in the case of reproduction that the endocrinic system is important. There is scarcely a branch of metabolism which is not affected by these glands. Especially is this the case with the metabolism of calcium and carbohydrates.

Extraordinary perversions of the normal balance of metabolism occur as the result of inco-ordination of the endocrinic glands, and it is not surprising that they have received the important title—"Regulators of Metabolism." Whether their influence on the chemical changes occurring in the body is established before or after the advent of nervous control it is at present difficult to say. There are, therefore, three possibilities.

Firstly, the primary form of control may have been chemical, and as the need for more rapid response to stimuli arose, nervous control was established.

Secondly, nervous control may have been the most primitive, and these chemical messengers may have been commissioned to relieve an over-taxed nervous system.

Thirdly, both methods of control may have been evolved simultaneously to meet different requirements.

Which of these explanations is likely to be correct it is difficult to prove at present, but most scientists seem to consider that chemical control is the most primitive form.

Although this function of the endocrinic system in regulating metabolism is accepted by most physiologists, some well-known scientists still uphold theories of an altogether different nature regarding the function of the internal secreting organs. As an example of such a theory may be quoted the following extract from an article by Dr. E. Sajous, of Temple University: this scientist holds that the only glands which influence the entire organism through their products are the thymus, thyro-parathyroid, adrenals, and pancreas. He writes:—"When the functions of these glands are considered collectively and inter-

woven physiologically, we have the fundamental mechanism for the vital and defensive processes of the body. Reduced to its simplest expression, the mechanism is as follows: the thymus supplies to all tissues the excess of phosphorus in organic combination (possibly as nucleins) required during the development of the body to build up its cell-nucleins. The thyro-parathyroid secretion sensitises these nucleins to the action of oxygen. The adrenal secretion (through a katalytic ferment, adren-oxidase) endows the blood with its oxygenating properties. The pancreas supplies ferments which, in the intestinal canal and in the nutritional leucocytes, convert food particles into products harmonious to and for the building up of tissue-cells. All endogenous and exogenous substances which are not appropriate for tissue building are subjected in the phagocytic leucocytes and tissue-cells, the lymphatic system and plasma, to the katabolic phase of metabolism, which converts them into eliminable end-products. The defensive mechanism of the body thus forms part of its nutritional processes, the whole being dominated, as far as present knowledge enables us to judge, by the internal secretions above mentioned."

The foregoing theory serves to illustrate the fact that there must be enormous gaps in our collections of evidence concerning the ductless glands, since nothing else could explain the divergent opinions of eminent men. This branch of physiology offers a wonderful field for research, where one day a rich harvest will be reaped. The study of these glands, however, has its pitfalls. Nowhere else, perhaps, is such scope offered to the fertile imagination, and there is an enormous temptation to put forward very attractive theories, which are purely hypothetical and largely unsupported by fact. In truth, the term "internal secretion" threatens to assume a foremost place in the vocabulary of the baffled physiologist, since in many cases it offers an easy explanation to obscure and difficult actions.

Nevertheless the subject of internal secretion is one of great practical importance, and a clear understanding of its mechanism will be of good service to the practitioner. The distinguished pathologist, Starling, predicts a place of great importance for the endocrine organs in the

medicine of the future in the following words:—" If the mutual control of the body be largely determined by the production of definite chemical substances in the blood, the discovery of the nature of these substances must enable us to interpose at any desired place in these functions, and by this means to acquire an absolute control over the working of the human body. Such a control is the goal for which medical science must ever strive."

NEW PREPARATIONS.

PHYTIN (CIBA) AND FORTOSSAN.

In the number of this Journal for February, 1917 (Vol. 143, Third Series, No. 542, p. 152) we drew attention to and described these valuable food adjuncts which had been submitted to us by the Saccherin Corporation, Ltd., 36-37 Queen Street, London, E.C. It is, therefore, not necessary to do more after the lapse of nearly three years than remind our readers that " phytin " is a vegetable phosphate brain and nerve food which was originally introduced by Dr. Gilbert, Professor of Therapeutics in the University of Paris. It is the phosphorus reserve substance formed in plants by Nature, and contains 22 per cent. of phosphorus. This organic compound of phosphorus is easily assimilable, and has proved useful in various conditions due to malnutrition.

A handy way of prescribing and of using phytin is in the form of compressed tablets, of which each contains 4 grains (0.25 gramme). Of these the dose is one tablet four times a day, or as prescribed.

A diluted form of phytin suitable for infants and young children has received the name " Fortossan " (" bone-strengthener "). It is phytin with sugar of milk—itself a valuable food, and has been very beneficial in cases of rickets and general malnutrition in children of two years' old and upwards, in doses of 40 grains four times daily in milk or porridge. Even at the age of two months twenty grains may be given twice daily in the infant's ordinary food.

Manufactured by the Société pour l'Industrie Chimique at Basle, Switzerland, the British Agents for these preparations are the Clayton Aniline Company, Ltd., of 68½ Upper Thames Street, London, E.C.4.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Future of Medicine. By SIR JAMES MACKENZIE, F.R.S., M.D., F.R.C.P., LL.D. (Aber. and Edin.); F.R.C.P.I.; Hon. Consulting Physician to the London Hospital. London: Henry Frowde, Oxford University Press; Hodder & Stoughton, 20 Warwick Square, E.C. 4. 1919. Demy 8vo. Pp. ii + 238.

THOSE who have followed the writings and speeches of Sir James Mackenzie will be fairly familiar with the views that he expresses in this book, but which he has now systematised and elaborated. His main thesis is that true advance in Medicine must come from clinical every-day observation prolonged over long periods of time. Such advance, he holds, can be best made, not by specialists but by general practitioners, inasmuch as it is only the latter group of workers who come in contact with disease at its inception, and who then have an opportunity of watching the course of a disease throughout the duration of a patient's life. In order that a proper view of general practice should be inculcated during the career of a student, he urges strongly that every hospital staff should number amongst its members a general practitioner. With much that Sir James writes we are in sympathetic agreement, and undoubtedly his own work proves how much there is yet to be learned by patient and skilful observation. It appears likely, however, that a method of training capable of producing a person like the author of the book itself should not lightly be altered. In almost every branch of life a man's learns his work after graduation. His pregraduate studies constitute a mental training which should enable him to grapple with the problems encountered later on. Doubtless much that is of little use is included in the

ordinary medical curriculum, but once teaching becomes reduced so as to include only that which is of practical utility, it will cease to give that broad outlook which, in our opinion, is the first essential of an educated man.

Diseases of the Ear in School Children. By James Kerr Love, M.D., F.R.F.P.S.G.; Lecturer on Diseases of the Ear, University of Glasgow, &c., &c. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. 1919. Cr. 8vo. Pp. viii + 94.

There are few more important subjects in Medicine than diseases of the ear, when one takes into account the disabilities caused by deafness, and the mortality due to suppuration. The public are accustomed to look on running ears as of little consequence, and we fear that many medical practitioners do likewise.

This book will be of great use as showing the prevalence of ear disease in the school-children of Glasgow, and the fact that much can be done by systematic treatment to eliminate the dire consequences of neglect.

We can heartily endorse Dr. Love's excellent methods and conservative treatment. He clearly shows that by simply cleaning the external auditory meatus and preventing the re-infection in the middle ear by the numerous pyogenic and saprophytic organisms, which thus easily gain entry, a large number of cases rapidly heal up. He outlines a scheme suitable for the counties surrounding Glasgow. As an example of the numbers dealt with, there are 130,000 school-children in Glasgow, and about 500 cases of chronic middle-ear suppuration are constantly under treatment. As part of the treatment, Dr. Love considers the removal of adenoids and tonsils by operation essential.

The author discusses the question of hereditary deafness from syphilis, and shows what terrible ravages this disease has made. We can only hope that under the new methods of treatment now in operation much less of this form of deafness will be seen in future.

The writer finally discusses the possibility of the elimination of deafness, just as we have now, to a large extent, eliminated typhoid fever and some other well-known diseases.

We can thoroughly recommend this book to all health and school authorities, and it seems to us that something of the same sort of systematic treatment of school-children described by Dr. Love should be started in our own city.

H. L.

The Simple Carbohydrates and the Glucosides. By E. FRANKLAND ARMSTRONG, D.Sc., Ph.D., F.I.C. Third Edition. London: Longmans, Green & Co. 1919. Royal 8vo. Pp. x + 239.

THE first and second editions of this monograph were duly noticed in this Journal, and it is an encouraging sign that a third edition of an abstruse treatise should be soon required, and at a considerably enhanced price.

The text is not easy to follow, although written by an experienced hand, and while it makes heavy demands upon the chemical knowledge of its readers, it is as clearly put as the subject admits. The book deserves the close attention of physiologists and biological chemists, and gives a broad and accurate synopsis of a difficult subject.

There is no "simple" reading in it, for it is strong meat throughout, and the word "simple" merely connotes the study of the glucose (hexose) group, and of the disaccharides (*e.g.*, succose and maltose), to the exclusion of the complex polysaccharides (*e.g.*, celluloses and starches).

The subject-matter is distributed under nine chapters, and the last chapter, a regrettably short one, deals with the functions of carbohydrates and glucosides in plants. Glucosides have long been a physiological puzzle, and "the last few years have witnessed great progress in the novel interpretation of the function of glucosides as a means of keeping dormant substances of great importance in the metabolism of the plant until the precise moment at which they are required."

In most, if not in all, cases, the glucosides are accompanied by appropriate enzymes, which are able to hydrolyse the glucoside. One of the most curious things in plant physiology is the remarkable action of chloroform and ether in *stimulating* growth. Thus, mustard oil is formed from the leaves of certain cruciferæ, hydrocyanic acid from laurel leaves, when submitted to the action of chloroform.

Glucosides may also serve as a method of putting harmful waste products out of action.

Before closing this notice we must record, with the deepest regret, the irreparable loss to chemical science by the death of Emil Fischer.

By the extraordinary originality, depth, and fertility of his researches, especially on the carbohydrates and the proteins, he has added enormously to our knowledge, and stands forth as a pioneer and prince of investigators in many obscure fields of biological chemistry.

W. G. S.

The Third Great Plague. A Discussion of Syphilis for Everyday People. By JOHN H. STOKES, A.B., M.D., Chief of the Section of Dermatology and Syphilology, the Mayo Clinic, Rochester, Minn. Philadelphia and London : W. B. Saunders Company. 1917. 12mo. of 204 pages.

THE Author is to be congratulated on the very able manner in which he has clearly and simply presented to "everyday people" the accepted facts about syphilis. "The simple device of talking plain matter-of-fact English about a thing has a value that we are growing to appreciate more and more every day. It is too easy for an undercurrent of ill to make headway under cover of a false name, a false silence, or a misleading speech."

The cover that has so long hidden the facts about syphilis from the public knowledge is removed in this work in such an efficient and practical manner that all can undersand what syphilis really means, both to the indivi-

dual and to the community, under present conditions of diagnosis and treatment.

The author shows that this disease is a public health problem rather than a moral one, and that "as a moral policeman syphilis can be obliterated without material loss to the cause of sexual self-restraint, and with nothing but gain to the human race." We can thoroughly recommend the work both to the medical practitioner and to the general reader. The former will find it an exceedingly interesting and useful book, while the latter will not just pick up a "little learning" but a sound knowledge of what it is essential that everyone should know about syphilis if headway is to be made in the fight against the Third Great Plague.

Notes on Galvanism and Faradism. By E. M. Magill, M.B., B.S. Lond., D.P.H., R.C.S.I. (Hons.), Radiographer to the Military Hospital, Endell Street, London W.C. Second Edition with 67 Illustrations. London: H. K. Lewis & Co., Ltd. 1919. Cr. 8vo. Pp. xvi + 224.

Published early in 1916, this book has had a very successful career so far. It was reprinted in September, 1916, and again in May, 1917. The present edition appeared in March, 1919. There is no material change either in matter or in size. In reviewing the first edition in the number of this Journal for June, 1916 (Vol. 141, Third Series, No. 534, page 391), we ventured to criticise some points. The most important of our strictures had reference to the prominence given to the one-fluid theory of electricity, justly stated by the author to be obsolete, while the electron-theory was relegated to an appendix. This arrangement still holds and is regrettable.

With this reservation we have formed a favourable opinion of Dr. Magill's "interesting and instructive book" and we described it in our notice of the first edition.

A Treatise on Clinical Medicine. By WILLIAM HANNA THOMSON, M.D., LL.D.; formerly Professor of Practice of Medicine and of Diseases of the Nervous System in the New York University Medical College; ex-President of the New York Academy of Medicine, &c. Second Edition, Revised. Philadelphia and London: W. B. Saunders Company. 1918. Cloth. 8vo. Pp. 678.

THIS is a bulky volume of over 650 pages, but as the print is exceptionally large and the margin of the page ample, it contains rather less material than the average text-book of Medicine. It has the advantage of being easy to read, and of also being readable—in fact, here and there one is almost disposed to regard it as light literature. The first 70 pages deal with certain common symptoms—such as pain, emaciation, cough, dyspnœa, and the like—and constitute, especially from the student's point of view, a quite useful chapter. In fact, this preparatory portion of the work contains the exact sort of information that is usually lacking in a text-book, and ought to be obtained by attending clinical lectures. The remaining bulk of the volume deals more or less systematically with the diseases of the various organs. The writer intentionally omits more than very brief reference to laboratory methods and to pathology. This, in our opinion, is a mistake. The qualified man may require only clinical information: if so, he desires it in more detail than is here supplied. The student wants a complete picture of the disease he is studying, and many of the accounts here presented are not adequate. At the same time anyone who takes the trouble to read through the book will find that he has been in contact with a vivid clinical mind, and will have picked up much useful, even though scattered, information. The treatment of subjects is rather variable—some (*e.g.*, Graves's disease) receive quite full exposition, others, of almost equal importance, are dismissed in a few lines. Tumours of the brain, for example, are dealt with in just under a page.

A Manual of Diseases of the Nose, Throat and Ear. By E. B. Gleason, M.D., LL.D.; Professor of Otology, Medico-Chirurgical College Graduate School, University of Pennsylvania. Fourth Edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company. 1918. 12mo. Pp. 616.

On former occasions we have had the pleasure of reading Dr. Gleason's Manual, and, like its predecessors, this new edition bears the impress of careful revision. A good deal of new material has been added, and the whole book has been brought up-to-date. As mentioned in the preface, only fully tried and established operations are described, while sensational novelties are avoided.

The illustrations are numerous and apposite, and the descriptive letterpress is wonderfully complete for the size of the book, when it is remembered that the whole ground of Nose, Throat, and Ear Surgery is embraced within its six hundred pages.

Modern Medicine and some Modern Remedies: Practical Notes for the General Practitioner. By Thomas Bodley Scott, Author of "The Road to a Healthy Old Age." With a Preface by Sir Lauder Brunton, Bart., F.R.S. Second Edition. London: H. K. Lewis & Co., Ltd. 1919. Cr. 8vo. Pp. xv + 198.

In noticing the first edition of Dr. Scott's useful work in the number of the Journal for July, 1916, we paid a tribute to the General Practitioner, who, in our opinion, occupies a much more responsible and difficult position than the consultant. We cannot do better in recommending this book to all practitioners than quote the last paragraph of the preface to the first edition written by the late—alas! that we should have to use the word—Sir Lauder Brunton.

"It is a most welcome occurrence when a man fully qualified to do so writes down the ripe experience of his life so as to help his fellow-workers, who one and all may learn from him. I feel myself much honoured by the

request of my friend Dr. T. B. Scott to write a preface to his book, and in doing this I gladly acknowledge myself to be one of the consultants of whom I have just spoken, and to thank him for the knowledge I have gained from reading his book. Few, if any, will rise from its perusal without knowing something of which they were previously ignorant; and if other men qualified like Dr. Scott will follow the example he has set, and write down the results of their experience, the medical profession will gain greatly in knowledge and patients will benefit greatly by improvement in treatment."

Le Français enseigné par le Méthode intuitive et directe. Par P. DESSAGNES, Agrégé de l'Université, Professeur au Lycée Louis-le-Grand et à l'École supérieure de Commerce de Paris. Paris: Masson et Cie, Éditeurs. 1919. 8vo. Pp. viii + 304.

THIS elementary French Course is intended for foreigners. It is imbued with the principles of the "direct method," as practised by the professors of living languages in the secondary schools of the University of France.

The "direct method" is merely the application to a particular object of the essential principle of all instruction: an advance from the simple to the complex. In presence of his pupils, and with their constant collaboration, the professor synthetically reconstructs the language they are studying, setting out with the most elementary ideas, that is to say, with isolated words indicating material things, which can be shown by sketch or represented by model. The relations (position, force, weight, &c.) which the objects indicated bear to one another are then expressed in rudimentary sentences, the meaning of which admits of no doubt. These ideas, once acquired, serve for the understanding of others. Sentences become more abundant and more complex; the laws of grammar make their appearance at the moment when the development of the "course" renders them indispensable.

The professor can soon give actual little lessons on

matters bearing on known facts (temperature, phenomena connected with the seasons, and so on), in which lessons the elements of the language will be presented in their most concrete and most readily accessible form.

Appropriately enough at the present time the first lesson, occupying two pages, consists of thirteen sketches or drawings of a helmet, a képi (French soldier's cap), a rifle, a revolver, a sword, a belt, a cannon, a shell, a cartridge, a cartridge-box, a bayonet, a machine-gun (mitrailleuse), and a bomb (grenade).

The "direct method" strikes us as an excellent way of learning a language, and might well be adopted in our schools. It fails in one respect—it gives no clue to pronunciation.

The Year Book of the Scientific and Learned Societies of Great Britain and Ireland: A Record of the Work done in Science, Literature and Art during the Session 1917-1918, *by numerous Societies and Government Institutions. Compiled from Official Sources.* Thirty-fifth Annual Issue. London: Charles Griffin & Co., Ltd., Exeter Street, Strand, W.C. 2. 1918.

At infinite trouble and greatly increased expense the present number of this valuable year book has appeared. Its importance as a work of reference to learned societies is very great, focussing, as it does, the work of the scientific and learned societies of the United Kingdom. The synopsis of contents shows a wide range of interest; and in the present issue includes twenty-six societies not previously included. Medicine in this issue occupies an enlarged space; and its forty odd pages form interesting reading, as they contain the titles of many papers on past operation cases, many of which must tax the skill of civil surgeons for years to come. Besides all this we learn from the titles of many contributions many new pathological conditions begotten of gas poisoning, air flights, and shell shock. A study of the volume convinces us that the Year Book is worthy of the generous support it receives.

Sanitation in War. By LT.-COLONEL P. S. LELEAN, C.B., F.R.C.S., F.C.S., D.P.H., R.A.M.C., Assistant Professor of Hygiene, Royal Army Medical College. With an Introduction by Surgeon-General Sir Alfred Keogh, G.C.B., M.D., F.R.C.P. With 68 Illustrations. Third Edition. London: J. & A. Churchill. 1919. Cr. 8vo. Pp. viii + 368.

IN the first place we congratulate the author of this excellent Manual on his well-deserved promotion in Army Rank, next on the success which has so far attended his book. First published in May, 1915, it was reprinted in July of that year. The second edition, revised "somewhere in Egypt," appeared in January, 1917, and was favourably reviewed in the number of this Journal for the following October (Vol. 144, Third Series, No. 550, page 228).

The present and third edition has been subjected to revision and moderate enlargement (from 336 to 368 pages of crown octavo letterpress) "somewhere in Palestine." From this statement it will be seen that the author has had no lack of opportunity for giving a practical tone to his work, every page of which bears internal evidence that personal experience has played a large part in its evolution.

Now that active hostilities have happily ceased, we trust that this handbook of Hygiene will become as widely known to civilian as to military readers. If it does so, we can bespeak for the work an ever-increasing popularity and success. Also, the more comprehensive title, "Sanitation in War and Peace" will be needed for the next edition.

The Exact Diagnosis of Latent Cancer. By O. C. GRUNER, M.D. London: H. K. Lewis, & Co., Ltd. 1919. Royal 8vo. Pp. viii + 79.

THE author seeks to find a solution to the question of whether cancer is present, or likely to be present, by recording in an exact method the impressions and observations made in an ordinary routine examination of the blood. We think that his method may lead him to a conclusion, but that it would not be one for general application.

His standards of normality are the result of his own observation, and there is no standard fixed by which other observers might make use of his experience. Some statements appear to us to be unsupported by protocols. We think the term " exact " cannot be fairly claimed for the evidence brought forward.

The Theory and Practice of Massage. By BEATRICE M. GOODALL-COPESTAKE. Second Edition London: H. K. Lewis & Co., Ltd. 1919. Demy 8vo. Pp. xxi + 265.

IN the second edition of her book Miss Goodall-Copestake has brought her chapter on the treatment of fractures more up-to-date, though most authorities would approve of earlier voluntary movements being encouraged at certain joints in the case of some of the injuries described. In the chapter relating to injured nerve trunks emphasis is laid on the great importance of the posture of the limb during and between the treatments, and photographs are introduced showing splints supplied so as to effect rest in median nerve and musculo-spiral paralysis. A chapter is added at the end of the book describing in outline the after-treatment of certain war injuries, and giving illustrations of apparatus for exercising the various joints. The few changes and amplifications made will further increase the usefulness of this reliable book.

Transactions and Seventh Annual Report of the London Dermatological Society. London: John Bale, Sons & Danielsson, Ltd. 1919. Pp. 90.

THE London Dermatological Society, which was founded in 1911, is an actively working association, possesses an extensive clinic, and has made valuable contributions to dermatology.

The Transactions of last Session include several interesting communications—*e.g.*, The Real Dermatology, by Dr. L. Williams; Ulcers of the Leg (miscalled varicose), by Dr. Prosser White; and Vitiligo and White-spot Disease, by Dr. Bunch.

A photograph is given by Dr. Sibley of a case of keratosis follicularis (Darier's disease).

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

President—Sir John W. Moore, M.D. Dubl., F.R.C.P.I.
Secretary—J. A. Scott, M.D., F.R.C.S.I.

SECTION OF PATHOLOGY.

President—T. T. O'Farrell, F.R.C.S.I.
Secretary—J. H. Pollock.

Friday, October 31*st*, 1919.

The Teaching of Pathology.

Dr. T. T. O'Farrell read the inaugural address, which bore this title. [It is published in full at page 177.]

The President of the Academy complimented the President upon his address, and emphasised the indebtedness of the clinician to the pathologist in the elucidation of cases.

Dr. Moorhead said that, in his opinion, one might well jettison certain introductory subjects—such as botany and zoology—and replace them by elementary morbid anatomy, and even simple bacteriology, correlating both with clinical instruction. Wherever possible, cases should be followed to autopsy, and systematic pathological teaching be given at all clinical hospitals at least once a week. In particular, he would enter a plea for courses of chemical pathology—such as sugar-content of blood, &c., &c. He joined very heartily in complimenting Dr. O'Farrell upon an admirable address.

Dr. Boxwell referred to the difficulty experienced by the student of pathology upon being confronted by an entirely new terminology, nomenclature, and over-elaborate classification. Pathological teaching should be divorced from, but simultaneously correlated with, that of anatomy, physiology, and clinical instruction. No terms should be used without immediate confirmation by microscopical preparations. He strongly favoured simple chalk diagrams as a method of illustrating lectures. He also would like to see a division of the subject into clinical and research pathology, the former being that taught to the average student of Medicine.

Dr. Crofton dwelt upon the advantages of team work upon selected subjects of investigation.

Dr. O'Kelly alluded to the tendency of the student to drop pathology after passing his third professional examination, which was to be combated by the reappearance of the subject in the finals. For one intending to enter the practice of any branch of Medicine, he considered the subject of bacteriology to be overdone.

TRANQUIL TRACHEOTOMY, BY INJECTING COCAINE WITHIN THE WINDPIPE.

Professor St. Clair Thomson has published an interesting paper under this heading in the British Medical Journal, Oct. 11, 1919 (p. 460). This technical improvement for rendering tracheotomy quieter, simpler, and safer has been employed by the author and his pupils for the last six years, so that the method has been well tested in scores of cases before being published in detail, which it is now for the first time. It is equally useful if the tracheotomy is performed under a general or a local anæsthesia. After trials with a 5 per cent. solution of cocaïne it has been found that a solution of $2\frac{1}{2}$ per cent. is as effective. It is used as follows:—An ordinary hypodermic syringe is charged with about 20 drops of a $2\frac{1}{2}$ per cent. solution of cocaïne. As soon as ever the tracheal rings are laid bare the syringe is grasped, as one does a pen, with the forefinger about one inch from the extremity of the needle, and with this the windpipe is sharply stabbed between two rings. The middle, ring, and little fingers are resting on the neck, and they prevent the point from penetrating more than $\frac{1}{4}$ to $\frac{1}{2}$ in. within the lumen of the trachea The cocaïne solution is injected into the cavity of the windpipe, some 5 to 15 drops, and the needle is sharply withdrawn.

The liquid in the windpipe at once gives rise to a slight stuffy cough. It causes no spasm or distress, and as it trickles down toward the region which endoscopists know to be the sensitive spot of this area—viz., the carina at the bifurcation of the trachea—this tickling cough soon ceases. If there is no great urgency, ten minutes should be allowed to elapse, the time being occupied by clearing the front of the trachea, checking all the bleeding, preparing the tube and so forth. At the end of that time, the incision can be made into the trachea, and the canula introduced without pain, spasm or even the slightest cough as quietly and smoothly as the original incision through the skin. The calm with which this proceeding takes place is in striking contrast with the agitated, often bloody, and even dangerous operation of former days.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, September 6, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, September 6, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 16.8 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, September 6, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 16.8 and 15.1; Dublin Registration Area, 19.7 and 17.1; Dublin City, 18.1 and 17.3; Belfast, 14.6 and 14.8; Cork, 17.0 and 13.5; Londonderry, 12.7 and 13.0; Limerick, 12.2 and 11.5; and Waterford, 24.7 and 19.0.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, September 6, 1919, were equal to an annual rate of 2.7 per 1,000. Among the 112 deaths from all causes in Belfast were 1 from enteric fever, 2 from scarlet fever, 1 from diphtheria, and 17 from diarrhœal diseases. Of the 25 deaths from all causes in Cork, 1 was from diphtheria and 2 were from diarrhœa and enteritis of children under 2 years, and 1 of the 3 deaths recorded for Ballymena was from measles.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during

the week ended September 6, 1919, amounted to 190—94 boys and 96 girls, and the deaths to 163—83 males and 80 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 10) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 19.7 per 1,000 of the population. The rate for all deaths registered during the thirty-six weeks of 1919 ended September 6, was 25.2, while in the corresponding period of the preceding ten years, 1909-1918, it had been 22.5.

The 153 deaths appertaining to the Area included 1 from measles, 1 from enteric fever, 2 from dysentery, and 25 from diarrhœal diseases. In the three preceding weeks deaths from measles in the Registration Area had numbered 1, 0, and 0, and deaths from diarrhœal diseases, 30, 29, and 40, respectively. No deaths from enteric fever or from dysentery had been recorded in the 3 previous weeks.

Deaths attributed to pneumonia were 10 in number (comprising 2 from broncho-pneumonia, 1 from lobar pneumonia, and 7 from pneumonia, type not distinguished), as against 2, 6 and 5 in the 3 weeks preceding.

Tuberculosis caused 23 deaths as against 15, 18, and 16 respectively, in the three weeks preceding. Of the 23 deaths ascribed to tuberculosis, 14 were referred to pulmonary tuberculosis, 2 to tubercular meningitis, and 7 to other forms of tuberculosis.

Nine deaths were caused by cancer, 13 by organic diseases of the heart, and 2 by bronchitis.

Among the deaths of infants under one year old, 4 were due to convulsions, 24 to diarrhœa and enteritis, 1 to congenital malformation, 7 to premature birth, and 1 to congenital debility.

Fifty-three of the deaths regsitered during the week appertaining to the Area were of children under 5 years of age, 46 being of infants under one year, of whom 16 were under one month old. Forty-four (44) deaths of persons aged 65 and upwards were registered, including 37 deaths of persons of 70 years or upwards.

Of the 153 recorded deaths 55 occurred in hospitals and other public institutions.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended September 6, 1919, and the cases under treatment at its close, respectively, were as follows :—Enteric fever, 6 and 9 ; typhus 0 and 5 ; measles, 2 and 5 ; scarlet fever, 15 and 68 (exclusive of 21 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital) ; and diphtheria, 2 and 15. Two cases of pneumonia were admitted during the week, and 8 remained under treatment at its close. Of the deaths in hospital recorded during the week, 1 was from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, September 6, 1919, in 96 large English towns (including London, in which the rate was 10.5) was equal to an average annual death-rate of 10.7 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 10.8 per 1,000, the rate for Glasgow being 10.4, and that for Edinburgh 12.1.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ *N., Long.* 6° 15′ *W., for the Month of September*, 1919.

Mean Height of Barometer, - -	29.977 inches.
Maximal Height of Barometer (15th at 9 p.m.),	30.427 ,,
Minimal Height of Barometer (22nd at 9 p.m.),	29.325 ,,
Mean Dry-bulb Temperature, - -	54.1°.
Mean Wet-bulb Temperature, - - -	51.3°.
Mean Dew-point Temperature, -	48.7°.
Mean Elastic Force (Tension) of Aqueous Vapour,	0.342 inch.
Mean Humidity - -	83.0 per cent.
Highest Temperature in Shade (on 10th), -	71.9°.
Lowest Temperature in Shade (on 28th), -	37.1°.
Lowest Temperature on Grass (Radiation) (28th)	33.0°.
Mean Amount of Cloud, - - -	50.8 per cent.
Rainfall (on 16 days), - - -	2.003 inches.
Greatest Daily Rainfall (on 22nd), - -	0.474 inch.
General Directions of Wind, - -	S.W., W., W.N.W

Remarks.

September, 1919, in its first half bore the impress of the fine summer of the present year, for the weather was both warm and generally fine and dry. The latter half was less settled, and some sharp cold spells were felt, distinctly autumnal in character and forerunners of the coming winter. The mean temperature of the fortnight ended the 13th was 59.0° ; that of the following fortnight ended the 27th was 52.0°—a fact which illustrates the sudden lapse into autumn. The first "chill" came on the night of the 11th, when a shallow secondary depression which had formed over Ireland drifted slowly eastwards, a brisk N.E. wind springing up in its rear. Some thunder and lightning accompanied this disturbance. The weather took up again for a few days, but the summer heat did not return.

During the latter half of the month a series of deep atmospheric depressions passed the north of Scotland eastward to Scandinavia, and the weather became more and more unsettled and of a cyclonic type. Temperature was especially low on the 27th and 28th. There was a ground frost in exposed places on the morning of the 28th.

In Dublin the arithmetical mean temperature (55.5°) was 0.6 below the average (56.1°). The mean dry-bulb readings at 9 a.m. and 9 p.m. were 54.1°. In the 50 years ending with 1915, September was coldest in 1886 and 1892 (M. T. = 53.0°), and warmest in 1865 (M. T. = 61.4°) and 1898 (M. T. = 60.2°). In 1916 the M. T. was 56.8° ; in 1917 it was 57.5° ; in 1918, 52.8°, establishing a record for coldness.

The mean height of the barometer was 29.977 inches, or 0.067 inch above the corrected average value for September—namely, 29.910 inches. The mercury rose to 30.427 inches at 9 p.m. of the 15th, and fell to 29.325 inches at 9 p.m. of the 22nd. The observed range of atmospheric pressure was therefore 1.102 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 54.1°, or 4.6° below the value for August, 1919. Using the formula, *Mean Temp.* = *Min.* + (*Max.* — *Min.*) × .476, the mean temperature was 55.2°, or 0.6° below the average mean temperature

for September, calculated in the same way, in the thirty-five years, 1881–1915, inclusive (55.8°). The arithmetical mean of the maximal and minimal readings was 55.5°, compared with a thirty-five years' average of 56.1°. The mean maximum was 61.6°; the mean minimum was 49.3°. On the 10th the thermometer in the screen rose to 71.9°—wind, S.W.; on the 28th the temperature fell to 37.1°—wind, W. to W.N.W. The minimum on the grass was 33.0°, also on the 28th.

The rainfall was 2.003 inches on 16 days. The average rainfall for September in the thirty-five years, 1881-1915, inclusive, was 1.920 inches, and the average number of rain-days was 14. In 1871 the rainfall was very large—4.048 inches on, however, only 13 days; in 1913 it was 4.310 inches on 13 days; in 1896 no less than 5.073 inches fell on 23 days, establishing a record rainfall for September. On the other hand, in 1865, only 0.056 inch was measured on but 3 days. In 1912 only 0.570 inch fell on 8 days, and in 1915, only 0.907 inch, but on as many as 16 days. In 1917, the September rainfall was 1.579 inches on 15 days, and in 1918, 4.867 inches fell on as many as 26 days.

High winds were noted on 10 days, but never attained the force of a gale (8). Slight fog occurred on the 10th and 16th. A solar halo was seen on the 21st. Lightning was seen on the nights of the 12th, 17th, and 20th. Thunder and lightning occurred on the 2nd and 12th. Hail fell on the 22nd and 27th. There was an aurora borealis on the evening of the 2nd.

The rainfall in Dublin during the nine months ending September 30th amounted to 17.313 inches on 149 days, compared with 19.407 inches on 144 days in 1918, 22.471 inches on 139 days in 1917, 24.172 inches on 166 days in 1916, 20.172 inches on 150 days in 1915, 15.827 inches on 140 days in 1914, 20.982 inches on 140 days in 1913, 22.658 inches on 158 days in 1912, 12.599 inches on 120 days in 1911, only 10.968 inches on 112 days in 1887, and a thirty-five years average (1881–1915) of 19.540 inches on 144 days.

At the Normal Climatological Station in Trinity College, Dublin, the observer, Mr. A. W. Boyce, returns the mean atmospheric pressure as 30.004 inches; highest, 30.434 inches at 9 a.m. of 16th, lowest, 29.360 inches at 9 p.m. of 22nd.

The arithmetical mean temperature was 55.7°, the mean dry-bulb reading at 9 a.m. and 9 p.m. being 55.9°. Rainfall, 1.96 inches on 16 days, greatest in 24 hours, 0.46 inch on 22nd. The number of hours of bright sunshine was 135.5 ; daily average, 4.5 hours. On the 9th, and again on the 10th, there were 8.5 hours, and on the 2nd and 7th, 8.2 hours. At 9 a.m. the mean earth-temperature was 57.0° at a depth of one foot and 56.5° at a depth of 4 feet. The lowest temperature on the grass (terrestrial radiation) was 28° on 21st and 28th. The highest temperature in the shade was 77° on 10th ; the lowest was 36° on 28th. The mean maximum was 63.0°, the mean minimum was 48.3°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data :—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin ; Mr. T. Bateman, Malahide, Co. Dublin ; Mr. J. Pilkington, Stirling, Clonee, Co. Meath ; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin ; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin : Mr. F. Dudley Joynt, Donnybrook, Dublin ; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin ; Dr. Arthur S. Goff, Dundrum, Co. Dublin; Mr. W. J. McCabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin ; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow ; Miss Maude Mo re, Blairfinde, Greystones ; Dr. C. Denys Hanan, M.D., Royal National Hospital, Newcastle, Co. Wicklow ; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare ; Mrs. E. Davis, Castleconnell, Co. Limerick ; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 1.99 inches, on 14 days. Average, 2.04 inches on 13 days. Maximum in 24 hours, 0.36 inch on 4th. Rainfall since January 1, 17.01 inches on 148 days. Average, 20.88 inches on 138 days. Max. temperature in shade, 70.9° on 4th, 5th, and 9th ; min., 34.0 on 20th.

Malahide.—Rainfall, 1.665 inches, on 13 days. Average, 1.536 inches, on 11 days. Maximum, 0.46 inch on 4th.

Clonee.—Rainfall, 2.61 inches, on 18 days. Maximum, 0.59 inch on the 1st. Rainfall since January, 20.68 inches, on 154 days.

Phoenix Park.—Rainfall, 1.985 inches on 15 days. Maximum, 0.52 inch on 22nd. Bright sunshine, 154.2 hours, including 11.2 hours on 10th.

Cheeverstown.—Rainfall, 1.96 inches, on 18 days. Maximum, 0.33 inch on 4th.

Donnybrook.—Rainfall, 1.745 inches, on 15 days. Maximum, 0.410 inch on 22nd.

Ranelagh.—

Mean corrected Height of Barometer, -	29.974 inches.
Highest corrected Reading (on 15th and 16th)	30.42 inches.
Lowest corrected Reading (22nd, 21 hrs.) -	29.33 ,,
Mean Dry-bulb Temperature, - -	54.8°.
Mean Wet-bulb Temperature, - -	52.4°.
Mean Vapour Pressure, - - -	0.363 inch.
Mean Humidity, - - -	85 per cent.
Mean Maximal Temperature, - - -	63.5°.
Mean Minimal Temperature, - - -	47.5
Arithmetical Mean Temperature, - -	55.5°.
Highest Temperature in Screen (10th), -	78°.
Lowest Temperature in Screen (28th), - -	36°.
Lowest Temperature on Grass (28th), -	28°.
Nights of Ground Frost, - - -	4.
Rainfall (on 15 days), - - -	2.01 inches.
Greatest Daily Rainfall (22nd), - -	0.43 inch.
Mean Amount of Cloud, - - -	57.3 per cent.
Days of Clear Sky - - -	3
Days of Overcast Sky, - - -	9
General Direction of Wind, - - -	S.W.

Remarks.—A favourable month. September 10th and August 11th were the warmest days this summer, with maximal temperature of 78°; the night of September 10th was exceptionally warm, the dry-bulb reading at 21 hrs. being 71.3°, maximal temperature reached 70° or over on 6 days.

Dundrum.—Rainfall, 2.22 inches, on 18 days. Maximum, 0.37 inch on 22nd. Temperature ranged from 71° on the 10th to 39° on the 20th. Mean temperature, 55.1.°

Killiney.—Rainfall, 1.72 inches, on 13 days. Maximum, 0.66 inch on 4th. Average (24 years), 1.969 inches on

13 days. In August, the rainfall at this station was 2.07 inches on 10 days. Maximum in 24 hours, 0.62 inch on 28th. Average, 3.212 inches on 17 days.

GREYSTONES (Rathdown House).—Rainfall, 2.62 inches on 16 days. Maximum, 0.63 inch on 22nd.

GREYSTONES (Blairfinde).—Rainfall, 2.15 inches on 14 days. Maximum, 0.64 inch on 22nd.

NEWCASTLE.—Rainfall, 2.69 inches on 12 days. Maximum, 0.70 inch on 22nd. Mean temperature, 55.3°; maximum, 74° on 9th; minimum, 36° on 20th; mean maximum, 62.7°; mean minimum, 47.8°.

ENNISTYMON.—Rainfall, 5.75 inches on 20 days. Maximum 1.05 inches on 22nd.

CASTLECONNELL.—Rainfall, 2.83 inches on 13 days. Maximum, 0.61 inch on 22nd.

DUNMANWAY.—Rainfall, 3.63 inches on 16 days. Maximum, 1.18 inches on 3rd. On the night of the 30th also 1.05 inches fell, and in the daytime of the 1st, a fall of 0.42 inch occurred. The observer writes:—"With these exceptions it was a very fine month. No rain fell from the 10th to the 16th. The first ten days, and the 25th, were very warm. The rest of the month was cool, with frequent night frosts."

TYPHOID CARRIERS.

THE sites in which the typhoid bacilli persist in the body of typhoid carriers are beginning to be better known (*Journal of Clinical Research*, vol. vii., No. 1) than formerly as the result of the accumulation of bacteriological investigations made post-mortem in known carriers. Bindseil (Zeitschrift für Hyd. und Inf., May, 1918) collected six cases—one of his own and five from other sources. In his own case he found the typhoid bacilli within the gall-bladder, in the submucous coat of the gall-bladder, in gall-stones, in the bile-ducts, and in the liver. They were also present in the contents of both the small and large intestine; but they were not found in the contents of the stomach, nor in the spleen, kidneys, mesenteric glands, pancreas, heart-blood, bone marrow, or urine. The Journal suggests that a likely way of curing a carrier would be to operate on the gall-bladder.

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PART I.

ORIGINAL COMMUNICATIONS

ART. XII.—*The Cause of Eclampsia.*[a] By PROFESSOR HASTINGS TWEEDY, F.R.C.P.I., President of the Section of Obstetrics in the Royal Academy of Medicine in Ireland.

LADIES AND GENTLEMEN—I esteem it a great honour to be elected for the second time President of the Obstetrical Section of the Royal Academy of Medicine in Ireland.

The Section has done much in the past to foster enthusiasm and thought in the Dublin School, and the success of its achievements must fill your President with pride.

The saddest duty which devolves upon me at this our opening meeting is to voice our great sorrow at the loss we have sustained in the death of our Senior Fellow and Past President—Dr. Dancer Purefoy. The absence of his familiar figure comes to us to-night as a shock. We can so clearly recall his presence, lending prestige and enlightenment to our meetings throughout last session and other sessions too numerous for many to remember. He died as he would have desired, active to the last, leaving

[a] The Inaugural Address to the Section of Obstetrics in the Royal Academy of Medicine in Ireland, delivered on Friday, November 7, 1919. [For the discussion on this Address see page 251].

us an ideal of the courteous gentleman, the polished debater, and the true friend.

Dr. Henry Jellett's approaching departure for New Zealand is another loss to our Section it can ill afford. His long services in France deprived us for several Sessions of his presence. With cessation of hostilities we hoped to see him again supporting and guiding our debates with his impressive personality, but this is not to be. The New World's gain is our loss, and our united good wishes will follow him there.

During the war our Section encountered many vicissitudes and its work was carried on mainly by the exertions of its senior members, I trust that a change is coming, and that our younger Fellows henceforward will take a more prominent share in its deliberations.

In saying this let me not be understood to belittle the work of last Session, for indeed it was responsible for some of the most important communications ever submitted for our consideration. To select two, I may recall Sir William Smyly's paper on the treatment of Accidental Hæmorrhage by Cæsarean Section rather than by Hysterectomy, and Professor Dixon's paper on the Uterine Supports.

It is obvious that an increase of knowledge tends more and more to restrict the number of questions suitable for presentation at a Society such as this, and it is the business of your President to jealously keep open every channel of possible debate, and when to-night I declare that the cause of Eclampsia is no longer a mystery, I feel as though I am committing an act of academic suicide.

At the International Congress, London, 1913, I read a paper which suggested that ordinary food became poisonous during pregnancy, and when in this condition it gives rise to toxæmia and eclampsia.

I was led to such a conclusion by noting the recurrence of fits in women who had partaken of food even in small quantities, milk, whey, alcohol, &c. It was evident, too, that the bad effect was not produced as a result of decomposition, or irritation within the intestines, for it followed very rapidly after the food was taken. All experience

since collected has abundantly proved the truth and value of these observations.

I could not then explain, nor could I correctly guess at the manner in which pregnancy acted as a contributing cause. It is this difficulty which I shall now endeavour to remove.

Physiologists teach that our blood is rich in protective substances, which we call, for want of a better term, antibodies. These not only guard against the ravages of pathogenic bacteria, but also deal with food particles after they have entered the blood. The antibodies are thus concerned in the later processes of digestion. They are badly developed or entirely absent in the newborn. They become active shortly after birth, stimulated by an antigen richly present in collostrum and the early food of infants. They are provided to an extent far in excess of normal requirements, but are not unlimited in amount. This is proved by the sickness which may follow the ingestion of some unwholesome article of diet or drink, such as roast pork or bad whisky; and such dissimilar complaints as migraine, epilepsy, and chronic Bright's disease, will probably in the future be found to depend on a deficient antibody reaction.

The antibodies are called upon during pregnancy to fulfil a double rôle in addition to their normal work; they are compelled to deal with the albumen which is constantly exuding into the maternal blood from the ovum. The presence of the ovum protein is abundantly proved by the Abderhalden serum test for pregnancy, and the effect of this toxin is noted through all the degrees of toxæmia from morning sickness to eclampsia.

As a means of graphic illustration let us suppose the blood to contain but ten antibodies, five of which are required for the purposes of normal digestion, four are used up by the fœtal protein, one remains in excess and all is well. Should appetite increase, necessitating the expenditure of seven antibodies, toxæmia results. Again, the ovum poison may absorb seven with similar bad consequences.

A milk diet (requiring three antibodies) is substituted

for full meals and health is again established. Milk alone often fails to bring about a good result, and then the Rotunda Hospital treatment (having as its chief factor an absolute starvation) sets free protective substances sufficient to deal with all fœtal protein, and recovery rapidly follows.

In rare instances when the ovum poison is excessive, section has much to say to the better results consequent and when once a stationary condition of ill-health is established the call for a rapid emptying of the uterus becomes imperative and will prove successful.

The starvation which necessarily follows a Cæsarean section has much to say to the better results consequent on it than on those attendant on induction of labour and forceps delivery.

Convulsions occurring for the first time after delivery are always due to the presence of food in the intestinal tract.

Eclampsia viewed from the above standpoint is seen to be as certain in its ætiology as any other medical complaint, for the theory is in accordance with every fact known to the practical obstetrician.

Much that was formerly obscure now becomes plain. We see why multiple births are especially liable to eclampsia. Why blood-letting may relieve immediate symptoms by removing toxin, but antibodies are also taken away and the chances of ultimate recovery are not improved. Free absorption of water dilutes the poison and renders it less destructive to the liver, kidneys, and other internal organs; and we perceive the reason why former efforts to induce perspiration proved ineffective and dangerous. The poison consisting as it does of a protein substance could not be sweated away.

Similarly, increase to a normal urinary secretion is a favourable symptom, not because of toxin removed thereby, but simply as furnishing an ocular demonstration of its less irritating effect on the kidneys.

The epidemic incidence of eclampsia must be entirely dependent on food.

I have not in this address taken up your time arguing as to the truth of the food factor. I assume you are all in

full agreement with me here, and indeed there is no room for scepticism on the matter; but in this connection it is interesting to mention that a document reached the College of Surgeons this year giving statistics from a German source of the great increase in mortality and disease which had occurred in consequence of the semi-starvation incident to the war. Having enumerated this increase under their several heads, they arrive at eclampsia, which alone shows an improvement, and a very marked improvement over all other pre-war periods. They give the figures without comment.

I know that we belong to a conservative profession, and I am quite prepared to find "grinders" still teaching the thirty-five obsolete theories of the cause of eclampsia on the ground that a successful coach is careful to see that the student's knowledge does not outrun that of his examiners.

It is an old proverb that a prophet has little honour in his own generation while he has to make headway against the so-called orthodox opinions of the old school, but I now venture on the further outlook, and foresee the time when the food relation to this gravest of diseases will be unanimously understood and accepted, to the advantage of our science, and to the safety of woman in her most dangerous hour.

ART. XIII.—*A Case of Congenital Syphilis.*[a] By SIR JOHN MOORE, M.A., M.D., M.CH., D.P.H. DUBL.; D.SC. (*Hon. Causâ*), OXON.; F.R.C.P.I.; Senior Physician to the Meath Hospital and County Dublin Infirmary.

THE case which I am about to detail, although of a trivial nature, presented some features of interest, and therefore seemed worthy of being reported in the form of a Clinical Record.

On Saturday, September 20, 1919, B. M., a girl aged 12, was admitted to the Meath Hospital under my care, with a history of fits and labelled "infantile paralysis." I saw her next morning.

She was pale, looked delicate, was unable to speak, and

[a] Read before the Section of Medicine in the Royal Academy of Medicine in Ireland on Friday, November 14, 1919.

examination revealed complete loss of motor power in the left arm and leg. The knee jerks were increased more in the left than in the right limb, and ankle-clonus was also present in a marked degree. Temperature was subnormal; pulse 78 to 84; respirations 22 to 24; tongue coated. I noticed that her front teeth were notched, and the bridge of the nose was markedly saddle-shaped.

As the girl could not speak beyond a halting "yes" or "no," although she was quite conscious, I requested that her mother should be sent for in order that I might question her as to the patient's history. At our interview the mother told me that the child had never been strong. When three months' old she developed a rash which lasted for three or four months, and she had suffered from fits affecting the left side at intervals since August 23, 1918.

Further inquiry elicited the information that the mother had herself had a rash like her daughter's many years ago, after which she brought forth a still-born child at eight and a half months. This was before the subject of the present record was begotten. I asked whether her husband was alive, and was not surprised to get the answer—"No." "He was a painter." "He died in an asylum of general paralysis." In reference to the presence of aphasia in left hemiplegia, I asked whether the child was left-handed. The reply was in the affirmative.

The case was now quite clearly one of congenital syphilis. So, having cleared out the bowels by a dose of calomel, I prescribed "Donovan's solution" in the following mixture:—

℞ Liquoris Arsenii et Hydrargyri Iodidi, ʒii;
Syrupi Aromatici, ℥vi.
Aquæ, ℥vii.

"Half an ounce to be taken thrice daily after meals."

This mixture was commenced on September 23rd, and taken steadily during the little girl's stay in hospital. The dose of each salt was approximately one-quarter of a grain: three-quarters of a grain daily.

To make assurance doubly sure a Wassermann was performed in the Pathological Laboratory of the School of

Physic, Trinity College, on September 26th. Dr. T. J. Wigham reported "Full Positive."

Very rapid improvement took place under the specific treatment adopted. There were no more "fits." Power quickly returned in the left limbs, and day by day the faculty of articulate speech progressed from monosyllables to connected sentences, finally becoming absolutely normal. During her stay in hospital no epileptoid fits occurred. She was discharged on October 10th, exactly a calendar month from the date of her admission.

The very next day her mother brought her back to the hospital to see me. She stated that the patient had had a sharp pain in her right side from the time she left hospital the previous day, and that a rash was coming out at the seat of pain.

Without stripping her, I made a guess diagnosis of herpes zoster. This proved to be correct, groups of papules and vesicles already showing along the lines of distribution of the 5th and 6th dorsal nerves on the right side. Little, if any, constitutional disturbance accompanied this sequela, and the pain quickly subsided under local treatment by an oxide of zinc and lycopodium dusting powder and the application of wadding. The mixture containing Donovan's solution was continued until the child left hospital for the second and last time on October 28th.

Three or four points of interest appealed to me in connection with this case.

First—the very complete medical history of specific disease: in father, mother, and their ill-starred offspring.

Second—the marked benefit to the patient following the steady administration of a pharmacopœial preparation introduced by a Dublin pharmacist of high repute—Michael Donovan, M.R.I.A., Governor of the Apothecaries Hall of Dublin in 1829, and editor of the brief-lived *Annals of Pharmacy and Medica Medica* (1829), the best articles in which were also from his own pen. In these days of salvarsan, neosalvarsan, kharsivan, soamin, and other organic arsenic compounds too numerous to mention, and of the combined salvarsan and mercurial treatment of syphilis, we are perhaps too apt to forget older and no less effective

means of combating and defeating Spirochæte pallida in its entrenched warfare against the human race, including the innocent as well as the guilty.

Third—the situation of the central nerve lesion in the posterior root ganglion of the 5th or 6th dorsal nerve was in itself of interest. Evidence of this localisation was supplied by the distribution of the outward and visible sign of that lesion—the eruption showing in the scapulo-axillary and subscapulo-inframammary areas, or the 5th and 6th dorsal areas respectively. Among 410 cases of herpes zoster observed by Dr. Henry Head, those areas were affected in 48 instances. The third dorsal nerve area was affected in 34 cases; the fourth and fifth areas, each in 38 cases; the eighth area, in 36 cases. The table from which I have extracted these figures shows very clearly the frequency with which areas of the trunk are affected compared with the roots that supply the terminal portions of the limbs. Also the trigeminal area was affected in only 22 instances out of the 416 cases, the first (supra-orbital) division in 18, the second (infra-orbital) and the third (maxillary) divisions in only 2 cases each.

Although the circumstance is not directly cognate to this brief clinical record, I may mention that by a curious coincidence an analogous attack of herpes zoster, but on the left side of the chest, ushered in an acute and rapidly fatal miliary tubercular meningitis in a boy aged 8 years and 7 months, whose illness lasted only a fortnight. The lad was admitted to the Meath Hospital on Saturday, November 2, and died on Thursday, November 6, of this year. In this case the diagnosis was verified by an examination of the cerebro-spinal fluid during life, and subsequently by a *post-mortem* examination.

In this short paper I have touched merely the border of that vast field for study which syphilis and tuberculosis—those twin dread enemies of mankind—day after day present in the domain of Medicine to every inquiring physician, be he young or old.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Venereal Diseases: A Practical Handbook for Students. By C. H. Browning, M.D., D.P.H., Director of the Bland-Sutton Institute of Pathology of the Middlesex Hospital; and David Watson, M.B., C.M., Lecturer on Venereal Diseases, Glasgow University; Surgeon in Charge of the Venereal Department, Glasgow Royal Infirmary and of the Lock Hospital, Glasgow. With an Introduction by Sir John Bland-Sutton, F.R.C.S. London: Henry Frowde and Hodder & Stoughton. 1919. Cr. 8vo. Pp. xv + 336.

Medical students, and indeed we may add medical practitioners, owe a debt of gratitude to the authors of this practical handbook on Venereal Diseases. The authorship is in itself a happy combination of a surgical clinician and of a skilled and accomplished pathologist. As Sir John Bland-Sutton writes in an interim Introduction, "This modest handbook combines admirably the clinical and laboratory methods for recognising and treating syphilis, and its fell companion gonorrhœa. For students and practitioners, it is as useful as the Nautical Almanac for Mariners. The promotion of a correct knowledge of venereal diseases aids in their prevention as well as their cure."

The contents include a brief history of the venereal diseases, nine chapters on syphilis, ten chapters on gonorrhœa, three appendices, and an index. Appendix I. gives formulæ for Gram's stain. In Appendix II. the method of performing the Wassermann test is fully described, and in Appendix III. an ingenious method is given of rendering hard water suitable for preparation of the solution of old salvarsan without distillation. This would

not be necessary in cities like Dublin and Glasgow which have the good fortune to possess a soft-water supply.

The work is splendidly illustrated by no fewer than twenty-six colour plates, and as many as fifty figures in the text.

Much space, naturally, has been allocated to modern methods of treatment of both syphilis and gonorrhœa. This is quite right, but there is a risk that older and nevertheless useful anti-syphilitic remedies should be overlooked and forgotten. One remedy more particularly is in our mind—namely, Donovan's solution—official in the British Pharmacopœia of 1914, under the expressive name of Liquor Hydrargyri et Arsenii Iodidi. In this preparation, manufactured and introduced by a Dublin pharmacist, we have a forerunner of salvarsan, kharsivan and their tribe, when administered simultaneously with mercury and the iodides.

The publishers deserve a word of praise for the manner in which this book has been brought out. The volume is of a handy size, and is printed in fine, bold type on choice paper, with wide leading which greatly aids the readers' eyes. We feel sure that this work will shortly win its way into favour and become one of the most popular text-books on the subject of which it treats.

Facial Neuralgia and its Treatment. By J. Hutchinson, F.R.C.S.; Surgeon to the London Hospital. London: John Bale, Sons & Danielsson, Ltd. 1919.

Trigeminal Neuralgia to all who practise in Medicine or Surgery has a special and significant meaning. Few can look unmoved on the fearful suffering of the unfortunate victim, and to very few only is it granted to have the opportunity and skill to afford relief.

The monograph with which we are concerned deals fully with this dread complaint, and discusses all the various drugs, injections, and operations which have been tried. The Author frankly states that for major neuralgia there is but one cure—the partial excision of the Gasserian

ganglion, and conclusively points out the best, if hard, path which must be followed for a successful issue. Briefly we may sum up his advice. Once the major form of the neuralgia has been recognised, an operation should be advised which should embrace the removal of the lower two branches of the fifth nerve with the portion of the ganglion related to these two nerves, leaving the upper part of the ganglion with the ophthalmic branch intact. He explains at great length the advantages accruing from thus splitting the ganglion, and brings forward cases in proof of his statements, proving that greater safety during the operation, with preservation of the eye, is thus secured.

The author is to be warmly congratulated on his marked success and low mortality. The references to other workers in the field are full, and enable the reader, should he so desire, to find further literature on the subject.

H. L.

Aids to Ophthalmology. By N. Bishop Harman, M.A., M.B. (Cantab.), F.R.C.S. (Eng). Sixth Edition. London : Baillière, Tindall & Cox. 1919. F'scp. 8vo. Pp. viii + 226.

We can heartily recommend this little book to all senior students.

The chapters on "Eye Therapeutics" and "Eye Conditions in School Children," are especially good, also the concluding one, "Examination Questions." In a later edition we would like to see more of these latter, entirely agreeing with the author as to their value to the student.

Having regard to the position of the chapters, might we suggest that it would assist the beginner in his conception of the subject if amblyopia, colour vision, and hemianopsia were included under diseases of the optic nerve and retina. Malingering, which is here dealt with in the chapter "Amblyopia," might then readily form a section by itself.

We wish this sixth edition the success of its predecessors.

Lo Sperimentale: Archives of Normal and Pathological Biology. Year LXXIII. Fasciculi 1-11. Firenze. 1919.

This number of our valued contemporary is principally devoted to reporting the Proceedings of the Medico-Physical Academy of Florence. However, it contains some interesting original contributions. The opening paper, "Adeno-epithelioma Cysts," traces their origin to histiological degeneration of sudiparous glands; and the author, Dr. Oscar Oblath, appends an illustrative case of a female patient, sixty-eight years of age, who had such a tumour at the superior internal angle of her eye. The growth, she states, began some thirty years ago; the increase in size was very slight for five years, afterwards it grew more quickly. The superficial covering was almost normal, being unmarked other than by a slight inflammatory redness. The article is very readable and convincing, if we accept the postulate as to the cause of tissue degeneration, and are in no way curious as to the source of the degeneration. An unusually beautiful photogravure accompanies the article. From the Military Laboratory of Mogliano Venete Drs. Zironi and Capone supply a paper on the Spontaneous Agglutination of Anaërobic Bodies, which is valuable, both as an exposition of their own researches and as a summary of that of other recent workers on the subject.

But the principal feature of the magazine is the Report of the Meeting of the Medico-Physical Academy of Florence, which opens with a series of papers on the ætiology of influenza. The editor notes that some of the papers have not yet come to his hand—*e.g.*, that of Professor G. Banti, entitled the "Pathological Anatomy" of the disease; and that of Dr. G. Gusparini on the "Epidemiology and Prophylaxis" of the disease. Professor F. Schupfer's paper entitled, "Some Considerations on Influenza," occupying sixteen pages, goes over the old ground of the claims of Pfeiffer's bacillus to be the *fons et origo* is considered. Conflicting claims are considered and no decision is arrived at. The article is, as a critical examination of the pathology of the disease and as a clinical

picture of its more marked features, a welcome addition to medical literature. Even at the expense of space we may be allowed to draw attention to the decision of the President, Professor G. Chiarugi, who declared that to avoid repetitions, he divided the subject-matter into the following heads :—Epidemiology, research, bacteriology, anatomico-pathology, clinical characters, and therapeutics. All speakers to confine their observations to one head and all irrelevancies to be ruled out. It is a pity this much-to-be-commended ruling is not enforced in all our medical societies.

The Essentials of Chemical Physiology for the Use of Students. By W. D. HALLIBURTON, M.D., LL.D., F.R.S., F.R.C.P.; Professor of Physiology in King's College, London. Tenth Edition. With Coloured Plate. London : Longmans, Green & Co. 1919. Demy 8vo. Pp. xi + 324.

TEN editions in twenty-six years is not a bad record for this excellent book. In the number of this Journal for February, 1917 (Volume 143, page 119), we indicated the chief additions which had been made in the ninth edition.

In a very short preface to the present edition the author admits that the great difficulty experienced in revision was to add new material without increasing the size of the book. The task has been accomplished by judiciously cutting out matter which was no longer necessary. The number of pages is 324, exactly the same as the number in the ninth edition published in September, 1916.

As examples of the sterling value of the contents of this work, we might instance the sections on vitamines (page 82) and on margarine (page 83). The latter, writes the author, "has now become a staple article of diet, and the old prejudice against this butter substitute has largely disappeared, partly because of the stress of war, but mainly because margarine makers have learnt how to make it palatable. The best margarine is called oleo-margarine, and is made with beef fat as its chief basis. It is a valuable food, and contains the fat-soluble accessory substance or "vitamine."

A Vision of the Possible. What the R.A.M.C. might become. By JAMES W. BARRETT, K.B.E., C.B., C.M.G., M.D., M.S., F.R.C.S. (Eng.); Temporary Lieutenant-Col., R.A.M.C.; lately Lieutenant-Col., A.A.M.C. and A.D.M.S., Australian Force in Egypt; Consulting Oculist to the Forces in Egypt, and Registrar, First Australian General Hospital; Ophthalmologist to the Melbourne Hospital. London: H. K. Lewis & Co., Ltd. 1919. Demy 8vo. Plate and 2 Maps. Pp. xx + 183.

WE have read through this little book with the greatest interest. The main portion deals with the author's personal experiences as a member of the R.A.M.C. in Egypt, and with the problems with which he was faced as President of a Medical Board while serving in that country. His very wide experience of practically every department of the R.A.M.C., gifted, as he apparently is, with a very clear insight into both clinical and administrative questions, has enabled him to detect both the good and the bad points in the army medical organisation, and to furnish in his concluding chapters most useful suggestions regarding improvement in the service.

With most of his conclusions the present reviewer, who himself served in Egypt, is in hearty agreement. Within a week of arriving in the country it became at once apparent to him that men were coming out from England and were being sent all over the district to perform duties with which they were quite unfamiliar, without any attempt being made to give them preliminary instruction. In various lectures, since given at home, this fact has been pointed out, and it has been stated that one of the fundamental errors of the service was to assume that because a man has a medical degree he is fit to go anywhere and do anything in the medical line, without considering his special qualifications and interests. We are glad now to find that Sir James Barrett takes the same view, and says, "one of the greatest failures of the service has been the failure to train newly arrived medical officers."

The author of the book also calls attention to the fact

that "if an administrator imagines that he is omniscient, and capable of judging details in all branches of knowledge, he is certain to get into difficulty." True; and we may add that the omniscient attitude is the very one that discourages men, and leads those civilian medical men, who are in a position to advise others, to take up the attitude noted by Barrett in his preface, that they will not recommend any young men who mean to take medicine seriously to join the R.A.M.C. as at present constituted. The present writer, who has been a clinical teacher for over twenty years, well remembers that on one occasion he was asked to make a list of enteric cases who were fit to be moved from his hospital to another. His list did not meet with the approval of his Divisional Medical Officer, a person admittedly of little or no clinical experience, with the result that he was insulted in the presence of a couple of orderlies. Throughout his period of service incidents of a similar nature repeatedly occurred, with the result that he was heartily glad to resign when his year's contract was up. Later he acted as consultant physician elsewhere. These personal recollections are of little consequence, but they give point to some of the criticisms levelled against the control of clinical matters and of clinicians in general by men who are administrators alone.

Another complaint of the writer of the book is that patients are sent out from hospital without a clinical record being sent with them. This results, both at home and abroad, in enabling a malingerer or neurasthenic to go from hospital to hospital without being detected, and also results in the same work being done over and over again. A malingerer is, perhaps, thoroughly examined, and sent back to the line : he meets a new medical officer, and again feigns illness : he is again sent to hospital, probably not the same as before : he is again examined, and sent back ; again malingers, and so on. The forwarding of a short clinical report with each man when he is sent out from hospital would obviate all this.

With many other criticisms we are in full accord, more especially with the complaint made that the clinician as

such cannot gain promotion, but is compelled on reaching a certain rank to drop clinical work and become an administrator; but, at the same time, we feel bound to agree with Sir James—that the work of the R.A.M.C. as a whole was carried out splendidly during the war. The officers of the R.A.M.C. are, as a group, men of the highest character, and are devoted to duty, but a little more independence of those above them in rank is much to be desired.

The Diagnosis and Treatment of Heart Disease. Practical Points for Students and Practitioners. By E. M. Brockbank, M.D. (Vict.), F.R.C.P., Hon. Physician, Royal Infirmary, Manchester; Lecturer on Clinical Medicine, Dean of Clinical Instruction, University of Manchester. Fourth Edition, with Illustrations. London: H. K. Lewis & Co., Ltd. 1919. Cr. 8vo. Pp. viii+158.

As recently as January, 1918, we reviewed the third edition of this useful little work. It has evidently filled a niche in the medical student's library, for two editions have been called for within the same number of years.

Some additions to, and alterations in, the text have been made, but the book remains—as we described it in a former notice—" practical and concise."

We agree with the author that to use the left nipple as a landmark is open to objection for the reason he gives in a paragraph at page 71. But to speak of " the *danger* of using the nipple as a landmark " borders on exaggeration. Of course, he means that it may mislead the observer.

There is one notable omission in the sixth Section. Speaking of the transmission of sounds and murmurs, no mention is made of convection as an agent in such transmission. The word " conduction " is made to cover both conduction properly so-called, or the transmission of sounds and murmurs through solid mediums, and convection, whereby sounds and murmurs are carried, or conveyed, by a moving fluid—in this case the blood-stream.

As a clinical guide to the physical condition of the heart, we have nothing but praise for Dr. Brockbank's book.

Immunity in Health: The Function of the Tonsils and other Sub-epithelial Lymphatic Glands. By KENELM H. DIGBY, M.B., B.S., F.R.C.S. Oxford Medical Publications. 1919.

THE author, in a book of about one hundred pages with many interesting illustrations, seeks to prove that the function of the lymphoid tissue is to provide the immune substances which protect, or help to protect, us in normal health. His argument is well sustained, and is based on the anatomical distribution of the lymph nodes and their constant supply of organisms. He believes that in the process of ingestion and digestion of the organisms which invade them the glands develop immune substances which are then liberated in the circulation.

His argument seems to us to be drawn from inference rather than fact, especially as regards the immune bodies. The theme is an interesting revival of an old theory; it is treated in a new way, and should lead to some new work. There are many suggestions in the book, and it will repay perusal.

A Text Book of Practical Therapeutics. With especial reference to the Application of Remedial Measures to Disease and their Employment upon a Rational Basis. By HOBART AMORY HARE, M.D., B.Sc.; Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; Surgeon, U.S.N.R.F. Seventeenth edition, enlarged, thoroughly revised, and largely re-written. Illustrated with 145 engravings and 6 plates. London: Henry Kimpton. 1919. Large 8vo. Pp. vii + 1023.

A STANDARD work which has reached its seventeenth edition needs little—whether it be praise or blame—at the reviewer's hands.

The work includes four parts. The first, running to only 46 large octavo pages, sets forth certain general therapeutical considerations. The second part deals with

drugs and embraces 472 pages. In Part III. remedial measures other than drugs are discussed, and directions for feeding the sick are given. Part IV. is devoted to the treatment of diseases and morbid conditions—these being arranged in alphabetical order. An index of drugs and remedial measures and an index of diseases and remedies complete the volume.

So far as official formulas are concerned the work is an international one, for references are nearly everywhere made in its pages not only to the United States Pharmacopœia, but also to the British Pharmacopœia. There is one regrettable exception. In a very valuable "Comparative Table showing the strength of the more important pharmacopœial substances and preparations in the preceding and in the present [United States] Pharmacopœia," which precedes Part I., there is no column giving information about the same or similar preparations in the British Pharmacopœia.

Page xiv, again, has become quite recently obsolete. It contains a list of the drugs and preparations withdrawn from the British Pharmacopœia during the war by the General Medical Council. In his Address to the Council on May 27th last, the President (Sir Donald MacAlister) stated that "the modifications in the *Pharmacopœia*, made in 1917 and 1918 to meet war conditions, were early in the [present] year announced by the Government Authorities concerned to be no longer necessary, the supplies of sugar, glycerin, and fats applicable to pharmaceutical uses being once more sufficient. By direction of the Executive Committee, after consultation with the Pharmacopœia Committee, the proper legal steps were accordingly taken to withdraw and cancel the temporary schedules of alterations; and the text of the *British Pharmacopœia*, 1914, was thus, after due notice, reinstated on April 30, 1919.

Although the title page of the present edition of Dr. Hare's work bears the date 1919, the Preface is dated "August 1918"—six months before it was arranged that the text of the British Pharmacopœia of 1914 should

be reinstated. To mention this is only just to the Author. To show that Dr. Hare has brought his great work up to date it is merely necessary to quote the following sentences from the Preface. He writes :—

"The great war has greatly increased our knowledge concerning shock, emphasised the need of proper methods of intravenous injection or of direct transfusion, and, therefore, greater consideration of these procedures is included than before. The use of Dakin's fluid and dichloramine-T by Carrell's methods, and the treatment of burns by paraffine are discussed for the first time."

The methods of prescribing a proper diet for the sick are described more in detail than in former editions, particularly in respect to children and to diabetics. As to the latter class of sufferers the so-called Allen treatment is fully described at pages 732 to 734.

We can recommend Dr. Hare's "Practical Therapeutics" with confidence.

A Report on the Scientific Work of the Surgical Staff of the Woman's Hospital in the State of New York. Edited by HERMANN GRAD, M.D. New York. 1918.

FROM the foreword of this volume of collected papers, we learn that it is the initial publication of the Surgical Staff of the Hospital. The opening paper contains a historical sketch of the founding of the Hospital, which took place in 1855, and had its inception and inspiration in the genius of one man—James Marion Sims, of South Carolina. Dr. J. R. Goffee, the author of the paper, would have us credit the "Woman's Hospital in the State of New York" with being the birthplace of the father of gynæcology, but we prefer to follow Sim's own choice, and place the honour with Montgomery, Alabama, where he bought the pewter tablespoon with which he made his first duck-bill speculum and published his paper in 1852, and three years prior to the establishment of the "State Hospital for Women," some six years after his brilliant success in Montgomery,

in March, 1849. The contribution is deeply interesting, and well repays reading.

Dr. D. Bissell contributes an excellent article on "Intermittent Hydro- and Pyo-nephrosis," illustrated by notes of six cases—a condition which he ascribes principally to abnormal mobility of the kidney. But in the cases he records the fixed kidney was the rule, and in this connection he seeks for causation in abnormal conditions of the ureter, or in a morbid growth pressing on the duct. In his cases he largely depended on the *x*-rays in forming a diagnosis, skiagraphs of which illustrate his paper.

A short paper on "Hypernephroma of the Kidney," by Dr. Strong, follows. His explanation is that "the hypernephroma cell represents a greatly exaggerated supra-renal cell," and the hypernephromata are, as a rule, hypertrophies of histologically normal supra-renal tissue. "Perforation of the Vagina by a Papillary Cyst of the Ovary" is the title of Dr. H. Grad's contribution. The case he gives is interesting, as being very unusual and rather difficult of diagnosis. Dr. Ford reports a case of "Procidentia in the Nulliparous Woman." The condition is not so uncommon as is generally supposed, and is usually produced by hard work, tight lacing, or prolonged retention of urine. A paper of great practical value is that of Dr. Dorman, on "The Toxemias of Pregnancy." It is well worthy of study by specialist and practitioner.

We congratulate the staff on their initial publication, and we hope to see it followed by many worthy successors. Also, we are glad to find the Hospital in which Sims took such a warm interest attain such distinction in the founder's specialty.

The Early Diagnosis of Tubercle. By Clive Riviere, M.D., F.R.C.P.; Physician to the City of London Hospital for Diseases of the Chest. Second Edition. London: Henry Frowde and Hodder & Stoughton. 1919. Cr. 8vo. Pp. xii + 314.

We have read through this, the second edition of Clive Riviere's little book on the Early Diagnosis of Tubercle

(Pulmonary Tuberculosis) with much interest and profit. We recommend it strongly as a thoroughly practical, scientific, and readable work. The subject is dealt with systematically. After a brief account of the symptoms which lead to a suspicion of the presence of active tubercular disease, the writer deals exhaustively with the all-important subject of physical examination, and describes in detail the method which he himself employs. The relative values of percussion and auscultation are considered in a thoroughly commonsense way, while it is admitted that the value of each method depends largely on the skill of the individual observer. Naturally enough, much stress is laid on the reflex bands of dulness to which the writer himself first called attention, but whether these will prove as useful as diagnostic aids in the hands of others is a matter on which we are not at present competent to express an opinion.

A special chapter is devoted to "hilum tuberculosis." In this chapter we believe that many medical men will find a solution of many problems that had previously perplexed them.

The special tests are next described, including examination by x-rays, the various tuberculin tests, sputum examination, opsonic determination, and the complement fixation test. The value of each of these is duly apprised, and throughout much stress is laid on the all-important fact that it is the presence of active tuberculosis and not of old-healed tuberculosis that must engage our diagnostic energies. The last part of the book is devoted to a consideration of tuberculosis in children. In this part involvement of the thoracic glands is fully dealt with.

Transactions of the American Pediatric Society. Thirtieth Session, held at Lenox, Mass. Edited by Oscar M. Schloss. Volume XXX.

As we turn over the pages of this volume of Transactions we are pleased with and envious of our American brethren's interest and research in the ætiology, prophylaxis, and

treatment of children's diseases. The volume (XXX) to hand contains 38 papers, each one of which tells of accurate observation and careful research; and every paper elicits an interesting discussion. Very happily, the Presidential Address, by Dr. L. E. La Fétre, is occupied with a description of the care the French Nation takes of the poor during the early years of childhood; and in it he eloquently urges his professional brethren and fellow citizens to copy the self-denying régime France practises in the midst of her sufferings.

The greater number of the papers are of a practical nature. Many are clinical pictures which graphically pourtray the difficulties which beset both diagnosis and therapeutics. We can do no more than refer to a few papers which deal with the more unusual conditions of the medical clientèle. First, we would draw attention to Dr. H. Caille's paper "Hemoptysis Following Exploratory Puncture of the Chest." A result so very unusual that the author deserves credit for putting on record his unpleasant experience. Dr. Art's contribution, "Breath Holding in Infants," is a good clinical picture of a not uncommon and very alarming symptom of infantile neurosis, which we have known to seriously alarm mothers. "Infantilism," by Dr. Griffith, is the history of two cases of this peculiar abnormality, in which some of the more marked features are wanting and some unusual ones were present. The difficult problem of the "Variations in the Lipoid Content of the Blood of Infants," by Drs. Marriott and Sissons, is the story of a technical research into the results obtained by experiments on animals and biochemical and biological examinations of infants' blood to determine, if possible, the biochemistry of infantile life. The paper is the outcome of much labour and thought. Whilst complimenting the authors on their patience and skill devising experiments we cannot fail to recognise that their harvest has not filled their bosoms with sheaves.

"Twenty-six cases of Pyloric Stenosis" is the title of Dr. Kerley's paper. The twenty-six cases all occurred in

his own practice, and all the patients were infants whose ages ranged from 3 to 16 weeks, and who ranged in weight from 4 lbs 2 ozs. to 10 lbs. In every instance Rammstedt's operation was performed. Of the cases 17 were boys and 9 girls; four cases ended fatally. It is a splendid record, and as we read it we are impressed with the idea that the procrastination of the operation, the natural result of paternal love, caused the fatal issue in the four unsuccessful cases. Dr. Carr reports a case of congenital "Hirschsprung's Disease," and Dr. McClanahan one of "Congenital Stricture of the Duodenum." A wonderful instance of the progress of surgery is Dr. Graham's case of a boy, 4 years and 10 months old, who was successfully operated on for cardiospasm and œsophageal stricture of congenital origin. "Unusual Hyperpyrexia" is the subject of Dr. Griffith's paper, in which he gives the clinical notes of two cases of pneumonia in children aged 2½ and 5½ years respectively, in one of whom the temperature reached 109° F., and fell 12 degrees within 12 hours. These are but a few of the many excellent papers with which the Transactions are enriched.

Essentials of Physiology. By F. A. Bainbridge, F.R.S., M.A., M.D. (Cantab.), D.Sc. (Lond.), F.R.C.P., Professor of Physiology, University of London; and J. Acworth Menzies, M.A. (Dunelm.), M.D. (Edin.), Professor of Physiology, University of Durham. Third Edition, thoroughly revised. London: Longmans, Green & Co. 1919. Demy 8vo. With 179 Illustrations. Pp. viii + 484.

It is quite a difficult task nowadays to keep a text-book on Physiology within reasonable size and yet include all the information that the ordinary medical student is required to know. In this volume the authors, by judicious selection and condensation, have been highly successful, and the result is a book of only 484 pages, which contain a marvellous amount of thoroughly up-to-date material in a very readable form. Of course discussion of the work

which has led to our present conclusions on many problems has necessarily been ruled out, and work and theories which are only of historical importance, but which are still of intense interest to the advanced student, are omitted. No attempt is made at a bibliography. We mention these facts not as detracting from the value of the book to medical students, for whom it is intended, but as showing the limitations imposed on it by its authors.

This edition has been thoroughly revised, the diagrams and illustrations are excellent and well reproduced, many of them in colours, and we are sure it will more than maintain the popularity of the book. The index is well done. Altogether, we know of no more attractive and comprehensive presentation of physiology from the point of view of the medical student.

IRISH UNIVERSITY CALENDARS.

1. *The Dublin University Calendar for the Year* 1919-1920. To which are added the Ordinary Papers set in the Year 1918-1919. Vol. I. Dublin: Hodges, Figgis & Co., Ltd. 1919. 8vo. Pp. viii + 60* + 356 + cxxvi.

2. *The National University of Ireland Calendar for the Year* 1919. Dublin: Alex. Thom & Co. (Ltd.). 1919. 8vo. Pp. viii. + 616.

We welcome the Calendars of these two Irish Universities, and are only sorry that an opportunity has not been afforded to us of noticing the Calendar of the third of the three sister universities in Ireland—namely, Queen's University, Belfast.

1. There is practically no change in the form in which the first volume of the Dublin University Calendar for the current academic year has been published. As regards the numerical strength of the University we must await the information which will as usual, no doubt, be contained in Volume II. It will not appear until early in the coming year.

Reference to the principal changes in the courses of study made in the year 1918-19 is made at pages 30, 109-113, 116, 130, 135, 149, and 208. The Regulations of the School of Physic will be found set forth in fifty pages beginning with page 239. In these *post-bellum* days, when a qualification in Public Health is being eagerly sought for by medical officers both in the Senior Service and in the Army, the section relating to the Diploma in Public Health of the University will prove most useful to intending candidates.

2. The Calendar of the National University of Ireland is for the year 1919, but it did not appear until September. However, the volume makes up for its tardy publication by its elegance and the fulness of the information which its 600 odd pages contain. Changes in the Courses and in the Regulations for the academic years 1920 and 1921 are fully set out at pages 127 to 156 inclusive. These changes should be carefully studied by intending candidates.

A Dictionary of Treatment: including Medical and Surgical Therapeutics. By SIR WILLIAM WHITLA, M.A., M.D., LL.D., M.P.; Late Professor of Materia Medica and Therapeutics in Queen's University, Belfast; Consulting Physician to Royal Victoria, Belfast Ophthalmic, and the Ulster Hospital for Women and Children. Sixth Edition. 32nd Thousand. London: Baillière, Tindall & Cox. 1920. Demy 8vo. Pp. viii + 1083.

WE were on the point of declaring that the success of Whitla's "Dictionary of Treatment" had been phenomenal when the thought suddenly struck us that the intrinsic value of the work had secured its success, which was therefore in no sense phenomenal, but only what was to be expected.

The present edition has been prepared for publication amid the many distractions of strenuous and punctual attendance on the part of the author in the House of Com-

mons. In that famous arena Sir William Whitla has made his mark as surely as he did in active professional life, and as a medical author in past years. How faithfully he has fulfilled his Parliamentary trust and how thoroughly he has justified Queen's University, Belfast, in chosing him as her first representative in the Imperial Parliament we have good reason to know and to acknowledge with gratitude.

The fifth edition of the "Dictionary of Treatment" was long out of print, but the author tells us that he felt no inclination to settle down to the work of revision whilst the fate of the Empire and of human civilisation was hanging in the balance during the anxious years of the late terrible war. But now the volume has been brought up to date, and the author, as on previous occasions, has wisely called to his aid competent authorities in surgery, gynæcology, and ophthalmology. The surgical articles, originally contributed by Mr. A. B. Mitchell, have been carefully revised and added to by Mr. S. T. Irwin, Surgeon to the Royal Victoria Hospital. Dr. R. J. Johnstone has brought up to date his original monographs on gynæcological subjects, and Dr. Wiclif McCready, who is ophthalmologist to several Belfast institutions, has corrected the proof sheets of the ophthalmic articles.

Every page of Sir William Whitla's work, which may well be termed a "classic," is replete with valuable information, and the busy medical practitioner will never consult the "Dictionary of Treatment" in vain when at a loss for suggestions as to what should be done in puzzling and even in simple cases of disease.

J. W. M.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

President—Sir John Moore, M.D. Dubl., F.R.C.P.I.
Secretary—J. A. Scott, M.D., F.R.C.S.I

SECTION OF OBSTETRICS.

President—E. H. Tweedy, F.R.C.P.I.
Secretary—T. Neill, M.B., B.Ch., B.A.O., Dubl.

Friday, November 7, 1919.

Presidential Address on Eclampsia.

Professor Hastings Tweedy, in the course of his Presidential Address, said that the cause of eclampsia was no longer a mystery. (The Address is published at length at page 225 of this number of the Journal.)

Dr. Bethel Solomons said that the intestinal toxæmic theory as outlined by Dr. Tweedy was proved by practical experience, but he hoped that a real scientific value would soon be attached to the theory. He suggested that knowledge might be gained by a series of examinations of the fæces of the eclamptic as compared with the fæces of the non-eclamptic pregnant woman. He looked on thorough intestinal lavage as the pre-eminent feature in treatment, and he cited a series of 30 successive cures of severe eclampsia which had occurred when he was assistant to Dr. Tweedy as bearing out the intestinal theory.

The difficutly in treating the pre-eclamptic patient was sometimes great. The physician had two courses open to him:

1. Keeping the patient for an indefinite time on a water diet.
2. Inducing labour.

He (Dr. Solomons) favoured the latter course when the patient was away from skilled attendance, for he thought the danger attendant on the departure from the water diet was greater than the possible danger of fits occurring as a direct cause of the induction. Where the patient could be watched carefully the water treatment could be carried out in most cases; in some, however, induction was necessary, while Cæsarean section was a *dernier* resort.

Sir William Smyly said that the theory propounded by Dr. Tweedy was consistent with and elucidated more of the ascertained facts connected with eclampsia than any of those which preceded it, and its application in practice had given

the best results. It was well konwn, for example, that fragments of syncytium, and, no doubt, other substances derived from the ovum, entered the mother's blood during pregnancy and were digested there, probably by the action of antibodies or ferments. In some cases, however, it would seem that these ferments were not present in sufficient quantity to digest the foreign matter poured into the circulation from both the ovum and intestine, though quite competent to deal with either alone; and that would explain why these cases are benefited by starvation. He had frequently seen serious aggravation in the patient's condition follow the ingestion of even small quantities of food. In a case which he had seen in consultation with Dr. Katherine Maguire, the convulsions, which had completely ceased for a week whilst the patient was restricted to water, returned after taking quite a small quantity of milk. Nor was this by any means an isolated case, for he had observed in others, especially in those in the pre-eclamptic condition, an improvement whilst restricted to water, and a disimprovement whenever food, even milk, was taken.

Dr. Rowlette said that whether Dr. Tweedy's teaching could be supported by experimental work or not, it had in its favour the great test of success in its working, and success in working was the chief test of truth. Dr. Tweedy had, by his method of treatment, reduced the mortality of eclampsia to a negligible figure. It had surprised him (the speaker) to find how slow obstetricians and teachers in other centres had been to recognise the advance that had been made. In some of the London hospitals they were still content with a mortality of fifty per cent., and they did not, in their reports, think it worth while to state whether they fed eclamptic patients or not. He regarded Dr. Tweedy's discovery as to the treatment of eclampsia as the most important advance in Medicine that had been made by the Dublin School in the past quarter of a century.

Red Degeneration of a Fibroid.

Dr. FitzGibbon showed a uterine fibroid which had undergone red degeneration.

Dr. Bethel Solomons asked if the specimen, which was macroscopically so typical of red degeneration, had been examined microscopically. He also wished to know if there was a history of pregnancy, as a case had occurred in his practice in which there was no such history. He inquired if the familiar smell of bad fish was present when the specimen was fresh.

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

REPORT OF SIR PATRICK'S DUN'S LIBRARY

PRESENTED TO

THE ROYAL COLLEGE OF PHYSICIANS OF IRELAND

On St. Luke's Day, 1919.

In accordance with By-Law XLVII, sec. 1, the Library Committee submits to the College the Report of Dun's Library for the year 1918-1919.

During almost the whole of the past year the buildings of the College have been in the hands of His Majesty's Ministry of Food, and in consequence the work of the Library has been greatly curtailed. The premises have now been returned to the President and Fellows; and it is hoped that the books which had to be displaced to make room for the Ministry of Food will soon be returned to their proper places.

During the year eight new books were purchased, and thirty-five were presented to the Library. In addition, thirty-five volumes were bound. The number of books borrowed by readers during the year was six hundred and ten. Various periodicals have been presented to the Library by Sir John Moore, Prof. Hastings Tweedy, Dr. Winter, Dr. Solomons, Dr. Rowlette, Dr. Gibbon FitzGibbon, Dr. Ella Webb and the Registrar. The Committee tenders its grateful thanks to the generous donors for these gifts.

A copy in silver of the Quin medal by Mossop has been presented to the College by Mrs. Richard J. Quin through Dr. Alexander Blackhall-Morison, who last year presented to the College the bust of Dr. Quin. The President and Fellows have already returned to Mrs. Quin and Dr. Blackhall-Morison their grateful thanks for this generous gift. The College is now fortunately in possession of a copy in silver and a copy in bronze of this medal, which bears an excellent likeness of Dr. Henry Quin.

In the *Dublin Journal of Medical Science* for December, 1909, there was published a short account of Sir Edward Barry, Bart., and some extracts from his correspondence with Lord Orrery. The letters there referred to were published in "The Orrery Papers," London, 1903, edited by the Countess of Cork and Orrery. Since that time three letters written by Barry to Lord Orrery have been purchased. These letters deal with matters of both medical and literary interest, and, as they do not appear ever to have been published, they are printed in full in this report.

Sir Edward Barry, Bart., by whom the letters were written, was born in Cork in 1698, being the son of Edward Barry, M.D., a physician in practice in that city. Barry was educated in Trinity College, Dublin, where he was elected a Scholar in 1716, and admitted Bachelor in Arts in 1717. He studied medicine at Leyden under the great Boerhaave, and graduated Doctor in Medicine there in 1719, the title of his thesis being "Dissertatio Medica Inauguralis de Nutritione." After obtaining his degree at Leyden, Barry started in practice in his native city of Cork, and from his house there on Orrery Quay two of the three letters now printed were written. In 1739 Barry left Cork and settled in Dublin, and from there the third letter was written. In 1740 he was admitted Doctor in Medicine in the University of Dublin; and on July 22nd of that year was elected a Fellow of the King and Queen's College of Physicians. In 1749 he was President of the College. Two years after he was incorporated at Oxford on his Doctor's Degree in Medicine; and on June 30th, 1761, was granted a License to practice by that University. On September 30th, 1762, he was elected a Fellow of the College of Physicians of London, and in the following year acted as Censor of that College. About this time Barry left Dublin and settled in London. Boswell tells us that Dr. Johnson described Barry as "a man who had acquired a high reputation in Dublin, came over to England and brought his reputation with him, but had not great success." About the year 1770 Barry left London and settled in Bath, where he died on March 29th, 1776.

While in Dublin Barry occupied many distinguished positions. In 1745 he was appointed Physician-General to the Forces in Ireland as successor to Upton Peacock. He was Member of Parliament for Charleville, Co. Cork, from 1745

to 1760. In 1754 he succeeded Bryan Robinson as Regius Professor of Physic in the University of Dublin, a post which he resigned when he left Dublin in 1761. On August 1st, 1775, he was created a baronet.

Barry published several works on medicine, some of which are of considerable interest. He also published shortly before his death a large volume in quarto on "The Wines of the Ancients." He was succeeded in the title by his eldest son Nathaniel, who is referred to in one of the letters as "Nat." Nathaniel Barry, whom Grattan characterised as the most accomplished gentleman he had ever met, was elected a Fellow of the King and Queen's College of Physicians on St. Luke's Day, 1751, and was President of the College in 1767, 1772, and 1775.

Lord Orrery, to whom these letters were addressed, was the fifth Earl of Orrery. He was the son of Charles, the fourth Earl, and grand-nephew of Robert Boyle, the celebrated philosopher of the seventeenth century, who has been described as "the father of chemistry and the son of the Earl of Cork." Lord Orrery was an intimate friend of Swift, but is now remembered chiefly as the author of a very disingenuous life of the great Dean, which he published in 1752.

With Barry Lord Orrery kept up a close correspondence, and Barry was not only his physician, but his intimate friend. It cannot be said that Lord Orrery occupies a distinguished position in the history of his time, either in literature or politics. His translation of the Letters of Pliny attracted some attention, but his "Life of Swift" exposed him to the taunt of being a false friend. We, however, owe him a debt of gratitude for the preservation of a correspondence which throws an interesting light on the social life in the eighteenth century.

Corke, 8br 28. 1737.

A Letter from my dear Ld Orrery was as agreeable to me as the Sun to a Laplander after a dark Winter. I dreaded the Cause of yr Silence but I am glad that my prophetic Fears are over. I have plac'd my chief Treasure in one Vessel and am apt to dread every Blast of Wind. But since you are under the Conduct of such a Palinurus[1] I shall almost

[1] The pilot of Aeneas, who fell asleep at the helm, and tumbled into the sea off the coast of Lucania: whence the name of the promontory near the spot.

think you safe in a Storm. I beg the favour of your Lordship to make my particular Respects acceptable to Dr. Meade,[2] I am obligd to him for remembering my Name.

I believe Mrs. Barry[3] must be obliged to fly to Bath for Relief; she has neither appetite or Digestion, and has now languished more than two years in that Disorder, I think her chief dependence must be on the Waters and I should regard it as a very providential Circumstance that the Recovery of her health and my views of settling there occurred in a point. Tis a peacefull Retreat that I should think myself most happy in. I'm satisfied it would add many years to my life, and I am satisfied I can never do more effectual Service to my Children than by fixing every one of them in England. Next Summer may probably bring things to a crisis. Cheyne[4] is still large enough to fill up all Vacancies.

Nat's[5] stay here for some time will make him more fit for his Station. I am constantly engaged in Examining and ordering the Structure of his Brain with all the attention of a nice Disection—I think I can depend on him. His Master tells me he is the most sober Boy in his School and the best Schollar in his Class. The Archdeacon[6] (for he is under our mutual conduct) is now more observant of his Body than his Mind. Nat is too fond of a Dishabille, and he tells him very justly that tho a decent cleanliness is recond but half

[2] Richard Mead, M.D., F.R.C.P. Lond., born August 11, 1673; died February 16, 1754. One of the most distinguished physicians in London during the second quarter of the eighteenth century, and the author of numerous works.

[3] Barry's first wife. She died "in child bed," May 5, 1741. In 1746 Barry married, as his second wife, Jane Dopping, daughter of the Bishop of Ossory. Her mother was a daughter of Dr. Ralph Howard, and her grandmother a sister of Sir Thomas Molyneux.

[4] George Cheyne, F.R.C.P. Edinb., born 1671; died 1742. He practised in London for some years, and then settled in Bath. As a result of his convivial habits he is said to have reached an enormous size, and to have weighed 32 stone. By restriction to a milk and vegetable diet "his size was reduced to almost one-third." He published many works on medicine.

[5] Nathaniel Barry, M.D., F.K.Q.C.P.I., born 1724; died 1785. He graduated M.D. at Rheims, and subsequently, in 1751, in Dublin. He married, January 3, 1758, Jane, daughter of Walter Jones, of Headfort, and had two sons, Edward and Walter, both of whom succeeded to the title, but died without children.

[6] Thomas Russell, M.A. Dub., 1715. Collated Archdeacon of Cork February 13, 1725. He was also Vicar-General of the Dioceses of Cork and Ross. He is mentioned several times in the correspondence of Lord Orrery.

a Virtue, the want of it in him would be next to a Vice. I have been often uneasie of late on our dear Archdeacons acct, he has been much out of order but I hope yr Lordship will see him well early in the Spring. He has fine Spirits in a weak Machine. His Life is a most Valuable one to his friends and as Hamlet says he is such a one—take him for all in all—I shall n'ere see his like again.

The Reduction of the Coin has made the whole Kingdom and especially this part of it mad. The money certainly wanted a Regulation, and if the Portugal Gold had been reduced to a less proportion and the forreign Silver raisd, every thing would be right; but 'tis almost a fatal Wound to ye Lisbon trade. Our City sent a proper petition to ye House of Commons,[7] but gave strange Instructions to their Members to refuse granting any Supplys till the Reduction was taken of. Betteswort[8] and Sir R. Cox[9] were in the

[7] By proclamation, dated August 29, 1737, of the Lords Justices of Ireland, a reduction had been made in the value of the gold coin of three pence in each guinea. The matter excited almost as much opposition in Ireland as had the proposed introduction of "Wood's half pence" some years earlier. The petition here referred to was presented to the Irish House of Commons by the Mayor, Sheriffs, and Commonalty of the City of Cork on October 18, 1737. The petition set forth "that by the late reduction of the gold coin in this kingdom they already feel great disadvantages and labour under many hardships in their trade, and praying the House to take their case into consideration." This petition, with others of a similar nature, was considered on October 26, 1737, and, after consideration, the main question being put that the reduction of the gold coin, as by the late proclamation, is destructive to the trade of the kingdom," the motion was lost by 118 votes to 30.—Journal of the House of Commons, vols. vi and vii. pp. 464 and 467.

[8] Richard Bettesworth, Serjeant-at-Law, M.P. for Middleton in 1737. He was a bitter enemy of Swift, and had threatened to cut the Dean's ears off with his penknife, as he believed him to be the author of the following lines :—

"Thus at the bar the booby Bettesworth,
Though half a crown o'erpays his sweat's worth;
Who knows in law nor text nor margent,
Calls Singleton his brother serjeant."

Swift refers to the incident in a letter to the Duke of Dorset, dated January, 1733-4.—Swift's "Correspondence," Ball, vol. v, p. 54.

[9] Sir Richard Cox, Bart., M.P. for Cloghnikelty, or Clonakilty, Co. Cork, in 1737. He was a grandson of Sir Richard, the first baronet, who had been Lord Chancellor, 1703 to 1707, and who died May 3, 1733. His father Richard, eldest son of Sir Richard Cox, had died April 15, 1725. Sir Richard was "teller for the Ayes" in the vote recorded in the House of Commons on October 26, 1737.

Court of Dover hundred when this affair was concocted. The petition has been rejected by a majority of 118 against 30. Pigot[10] is in a fright & designs to ask leave of the House to return home. The Methods wh have been used in this Case were such as must make them ineffectual. It was movd in ye House to send for the Mayor & Council & examine them on the floor they say 'tis a favour that they come of without broken Bones. This lessens the Censure that would otherwise fall on our County Corke Heroes and perhaps was a finesse in politics in Bettesworth. Sir R. C. is now the great patriot, but too much in Don Quixote's spirit considering our circumstances, he is a great Master of the Roman History; but would it not be more proper to read a Chapter of Job, than a speech of Brutus before he takes his place in the morning? Will Taylor is enrolld among ye Senators.[11]

Dean Swift sent lately a very handsome letter to ye City returning thanks for his Freedom wh was sent him with an Inscription in a Silver Box,[12] he says he valud it more than if it was in Gold and adornd with Diamonds & will be always their Friend to the utmost of his power. I had lately from a sure Hand the following acct of a Dialogue between him and the Primate.[13] He met him at the Ld Mayors before dinner

[10] Emanuel Piggott, Esq., M.P. for the City of Cork in 1737

[11] William Taylor, Esq., M.P. for Askeyton, Co. Limerick, in 1737. This was the "Will Taylor" referred to by Barry in a letter to Lord Orrery dated "Jany. 22d, 1735-6," where he proposes to play a joke on him about "a Hampier of Burgundy and another of Champagne."

[12] In 1737 the Mayor and Corporation of the City of Cork had presented to Swift the freedom of that city in a silver box. In a letter dated "Deanery House, Dublin, August 13, 1737," addressed to the Mayor and Common Council of Cork, Swift stated that he was returning the box, as there was no inscription on it, and "because it will equally fit everybody." A month later the Mayor returned the box suitably inscribed, and to this the letter refers. Swift had been presented with the freedom of the City of Dublin by vote of the Council on January 16, 1729-30. The Dublin freedom was given in a gold box.—Swift's "Correspondence," Ball, vol. vi, p. 42; "Calendar of Ancient Records of Dublin," vol. vii, p. 474.

[13] There are several versions of the story told here by Barry. The incident to which it relates took place at dinner given by James Somerville, Lord Mayor of Dublin, at the termination of his year of office on Michaelmas Day, 1737. The Primate, Hugh Boulter, was one of the Lords Justice, and was considered to be mainly responsible for the proclamation of August 29, 1737, reducing the gold coin. The Lord Lieutenant was the Duke of Devonshire. A correspondent of the Duke of Ormonde states that the dispute was started by the Primate accusing the Dean of en-

and took hold of his Gown and told him he was the greatest Enemy Ireland ever had—that a common Schoolboy could demonstrate that the Island must lose 10000£ a year by the Reduction; that if he had not softned the Mob they would have torn him to pieces, and that by lifting up his finger they would do it still, however he had a mind yt he should dye a natural Death. The primate said he knew of nothing wh he had done wh was a prejudice to Ireland, and if he would sett down his Objections in Writing he would answer them or gett some Body that should. While they were engaged the Ld Lieut. who had lately landed came in he then quitted his hold and asked who was that in the blue String, but no reply was made. When the Ld C. Baron[14] heard this he said the thin partition was broken down alluding to Drydens Distinction between great Wits & Madness.

Sir Thos. Penthergast[15] was attacked here in his Lodgings by a Mob of desperate Weavers he was obliged to come down to them & asked them what they wanted of him one of them said they came to roast a Michaelmas Goose. Bettesworth interposed and brought him of. Sir Thos gave them fair words and his Honor to serve them, but has since spoke on this subject in the House with a general virulence against the City, though he knew that all the principal Merchts & Inhabitants expressed a detestation to it. Piercy lent him Horses & he rode of in a pannic at four in the morning. As one of the family was rayd he dreaded the remainder would perish by an assination.

Ld Carberrys Brother[16] is elected for Castle Martyr, the

deavouring "to raise the mob." The matter is referred to in two of Swift's poems, "Ay and No" and "A Ballad."—Swift's "Correspondence," Ball, vol. vi, pp. 46 and 206; "Swift's "Poems," vol. ii, p. 275.

[14] Thomas Marlay, Lord Chief Baron of the Exchequer, 1732-1741, afterwards Lord Chief Justice of the King's Bench.

[15] Sir Thomas Prendergast, Bart., M.P. for Clonmel in 1737. Swift refers to him in two of his poems—"On Noisy Thom" and "The Legion Club." In the latter he calls him "that rampant ass." Sir Thomas Prendergast's father had been engaged in a plot to murder King William III, but to avoid being hanged he had turned informer, and as a reward was made a baronet.—Swift's "Poems," vol. ii, pp. 260 and 266.

[16] Thomas Evans, Esq., brother of George Evans, who had been created first Baron Carbery in 1715. His father, George Evans, M.P. for Charleville, had declined a peerage offered to him by George I.

Speaker[17] has been long under a promise which was insisted on, and he has a powerfull alliance. I think it was quite right if the Archdns letter to wh I was a stranger had come in time to be silent on that affair, for everything has already been said to him by yr Lordship that can be said—When Dr. Peacock[18] was lately ill, he warmly recommended me I am told to succeed him.

Pilkingtons wife[19] was found by her Husband and Brother in the close Embraces of a young Surgeon. Tho he has quitted her he said she has fixd in him lasting Memorials of their passion—Ex mollis flamma Medullas—I am ever my dr Ld Orrery's

faithfull & affect Ed Barry.

The following lines were this day handed about on the Exchange. The Author is not known, but his Dublin Wit I can't tell whether it will vex the Dean but I find it gives pleasure to his Enemies—

A short but true description of the famous Monster call'd

[17] Henry Boyle, Esq., M.P. for County Cork in 1737. He was chosen Speaker of the Irish House of Commons on October 4, 1733. In 1756 he was created Earl of Shannon.

[18] Upton Peacock, M.D., Leyden, 1717. He was admitted Candidate of the King and Queen's College of Physicians on January 24, 1720-21, but was never elected a Fellow. On February 10, 1725, he succeeded Sir Thomas Molyneux as Physician-General of the Forces in Ireland, and held the post till his death in 1745. Barry succeeded him, his patent being dated April 18, 1745.

[19] Letitia, wife of the Rev. Matthew Pilkington. They were both at one time close friends of Dean Swift, but eventually he was compelled to disown them. Letitia Pilkington was the daughter of John Van-Lewin, M.D., Dublin, 1729. Dr. Van-Lewin was admitted a Licentiate of the College of Physicians in 1711, and elected a Fellow in 1729. He was President of the College in 1735. He died on January 1, 1736-7, as the result of a wound, described thus in Pue's "Occurrence" for Tuesday, October 19, 1736:—"On Sunday morning, Dr. Van-Lewin has the misfortune to fall in his parlour, with a penknife in his hand, which entered into the cavity of his body, so that his life is despaired of." In the *Dublin Evening Post* for 1737-8, there is the following notice:—"Last Tuesday [Feb. 8], came on in the spiritual court the trial of Mrs. Letitia Pilkington, *alias* Van-Lewin, for adultery with Mr. Adair, which, being fully proved, sentence of divorce was pronounced by Dr. Trotter, Vicar-General of the Diocese and Judge of the Consistorial Court." In 1748, Mrs. Pilkington published her memoirs, which were afterwards continued to three volumes. She endeavours to justify her character, and to show that her husband had not, at all events, Biblical authority for being the first to cast a stone. Her son, John Carteret Pilkington, published his memoirs in quarto in London in 1760, and to this volume he has prefixed a fine mezzotint portrait of his mother by Richard Purcell, after Nathaniel Hone.—Swift's "Correspondence," Ball, vol. vi, p. 69.

Yahoo, to be seen at the Sign of the black flag & muffled Bells in patricks Street, and shewn publickly at my Ld Mayors Entertainment and no where else—

By Birth its a Bastard, incestuous in Love,
In Wit its a Serpent, in Wisdom a Dove,
Its a trumpet of Brass, and its only renown
Was to hoot at a rascal whom others knock'd down
As Goats that grow old become nasty and stink
This Beast be - - - ts all that come near him with Ink
Its as Belzebub proud, as Bedlam uncivil
Its a Priest that believes neither God or the Devil.[20]

I had this day an acct from Mr. Dickson[21] that the Speaker said I need not have given myself the trouble of writing to him, that Mr. Dilkes[22] had mentioned it to him before, and that he would certainly take care of it—and Mr. Dickson says I may depend on him if there is a Vacancy but by what I can find Peacock is in no immediate danger and may perhaps live longer than him who seeks to be his successor—But as Hamlet says—something too much of this.

I had a letter from Badham[23] from the Country since I wrote to yr Ldp to let me know he was afraid to venture on his Journey till he had acquired more strength, but designed to sett out immediately—I think he moves in that affair as if he did not like the Execution of it and was disappointed in his Views.

I have been engaged in preparing a surprizing subject one Wm. Clark[24] who lived always with Mr. Alworthy at the

[20] These scurrilous lines by an anonymous author are of some interest as showing the view held about Swift's domestic relations during his life by some of his enemies. According to Sheridan, Swift allowed that Bettesworth showed some wit in comparing him with his own yahoos, but this was some years before the date of Barry's letter. (Swift's "Correspondence," Ball, vol. v, p. 55.)

Swift is said to have caused a muffled peal to be rung from the bells of St. Patrick's Cathedral, and to have displayed a black flag from its tower, on the day on which the proclamation for reducing the gold coin was issued, August 29th, 1737 (Swift's "Poems," vol. ii, p. 277).

[21] This Mr. Dickson has not been identified.

[22] Michael O'Brien Dilges, M.P. for Castlemartyr in 1737.

[23] Bretteridge Badham, of Rockfield, County Cork, died 1744. "An agent who had proved unworthy of his post and caused Lord Orrery much trouble and financial loss" (Orrery "Papers," vol. i, p. 232).

[24] This skeleton, a specimen of *myositis ossificans*, was afterwards presented by Barry to Trinity College, and is still preserved there in the School of Physic. An account of it is given in Smith's

age of 18 complained of a stiffness in his Joynts in the space of some years they were all ossified. His Sceleton makes a most irregular figure, it is as difficult to describe it as the figure of the most irregular rock he may not improperly be said to have but one bone in his Body but branched out into many preternatural and irregular forms—I design to send an account of it to the Royal Society with the History of his Life and some observations on it— Thus I shall spend some part of my time agreeably with the dead but this curious memento mori before my eyes will not hinder me from often fixing my thoughts on my dear Ld Orrery to whom I ever shall be a

Faithfull & Affect
Ed. Barry.

Orrery Quay Dbr 16. 1737.

When I want Fame or Fortune who can I think of but my Dr Ld Orrery to direct and support me in my pursuit? Dr Cope[25] lies so dangerously ill that his Life is despaired of. By his Death the post of State Physician becomes vacant—I was yesterday with the Speaker at Clontarf and I dind with him to day he writes this post to the Duke,[26] Ld Duncannon[27] and the Primate[28] who is now in London, and will he thinks be of great weight in this affair. The antagonist I apprehend

"History of County Cork" (vol. ii. p. 426). Smith says that Barry had "composed a learned and accurate treatise on the subject," but this treatise does not appear to have been ever published ("History of the Medical School," Kirkpatrick, p. 128).

[25] Henry Cope, M.D., Leyden, 1708; Dub., 1717-8. Cope was admitted Candidate of the King and Queen's College of Physicians in 1718, elected a Fellow in 1723, and was President in 1728 and 1740. He was Regius Professor of Physic in the University of Dublin from 1738 to 1743, and State Physician from 1730 to 1743. He died on January 23rd, 1743, and was succeeded as State Physician by Robert Robinson, who was appointed on February 19th, 1743. Barry's efforts to obtain the position evidently miscarried.

[26] William, Duke of Devonshire, Lord Lieutenant of Ireland, 1737 to 1745.

[27] Viscount Duncannon, Brabazon Ponsonby, Earl of Besborough.

[28] The Rt. Rev. Hugh Boulter, Primate 1724 to 1742. He died in London on September 27th, 1742, and was buried at Westminster Abbey. On his tombstone it is stated: "He was born January 4th, 1671, He was consecrated Bishop of Bristol, 1718, He was translated to the Archbishopric of Ardmagh, 1723, and from thence to Heaven."

is young Dr Smyth[29] whose Brother travelld with the Dukes son and is now at Chatsworth, but as he is not yet provided for, and is to have the first great preferment that falls in the Church, 'tis probable he will not urge his Interest in this Case, and that a recommendation from the Government here where their own Health is engaged will prevail— The Speaker thinks I stand on most advantageous Ground, desird I would write to Ld Duncannon this post and mention particularly to yr Ldsp what is done I have wrote to Lady Allen,[30] and Ld George Sackville,[31] as the Duke of Dorset[32] formerly designed that post for me perhaps his Grace may be now more easily prevaild on to recommend me now or to gett Ld Wilmington[33] to do it. But whatever is necessary yr Ldsp will best judge, I only give Hints. This is a critical time of my Life if it succeeds I shall be fixd in my Throne and enjoy Negotium cum Dignitate, if it fails I shall never complain of Fortune while you are well, and while I am honoured with yr Friendship, which has already distinguished me, and will be my decus and præsidium while I live. My best respects to Lady Orrery[34] I shall soon write to her Ladyship

I am my dr Ld Orrery faithful
& affect Edw Barry

[29] Edward Smyth, M.D., Leyden, 1729; Dub., 1737. He was admitted a Candidate and elected a Fellow of the King and Queen's College of Physicians in 1738; and was elected President of the College in 1747. He died in 1778, and bequeathed a number of books to the Library of Trinity College.

[30] Lady Allen, the wife of Joshua, second Viscount Allen. "It is said that her marriage to Lord Allen was accomplished by a stratagem of the Duke of Dorset, and that Lord Allen refused at first to acknowledge her as his wife. By another trick, the circulation of a rumour that she had succeeded to a large fortune, she overcame his scruples, and through her masterful character soon obtained complete ascendency over him." Their house at Stillorgan, one of the finest in County Dublin, was designed by Sir Edward Lovet Pearce (Swift's "Correspondence," Ball, vol. iv, pp. 111 and 151).

[31] Lord George Sackville, son of the first Duke of Dorset.

[32] Lionel, Duke of Dorset, Lord Lieutenant of Ireland, 1731 to 1737.

[33] Spencer Compton, Earl of Wilmington. He was a speaker of the English House of Commons from 1714 to 1722. He died July 2nd, 1743.

[34] Margaret Hamilton, daughter of John Hamilton of Caledon, whom Lord Orrery had married as his second wife on June 30th, 1738. Her mother Lucy was a daughter of Anthony Dopping, Bishop of Meath. She was related to Barry's second wife (Swift's Correspondence," Ball, vol. vi, p. 85).

I have enclosed a letter to Dr. Mead— The poor Dean of St Patricks languishes fast he does not know Faulkners[35] name he was abroad with him he tells me this last week in his coach he spent his whole time in recknoning to twenty— That rascal Wilson[36] who lives with him has cheated him & lately beat him severely, he has practisd this custom for some time but was lately found in the fact & the Dean crying out—This you may depend on & Examinations are taken of it & he will be prosecuted.

Endorsed on the back in Lord Orrery's writing:—

"Dr. Barry without a date. recd: at Marston: Aug: 30th 1742. Acct. of Dean Swift's usage No. 57."

T. PERCY C. KIRKPATRICK,
Fellow and Registrar.

ROBERT PHELPS,
Dun's Librarian.

[35] George Faulkner, "the prince of Dublin printers," a friend of Dean Swift, and the publisher of many of his works.

[36] The Rev. Francis Wilson, D.D., Dubl., 1731. He was prebendary of Kilmactalway and Rector of Clondalkin. He is reputed to have not only treated Dean Swift with great cruelty, but to have sponged on him at the Deanery, and to have stolen his books. On July 13th, 1742, Wilson swore an affidavit in which he denies the charge of beating Swift, and stating that he acted only in self-defence. As the result of a Commission, de lunatico inquirendo, issued to the Rt. Hon. Luke Gardiner and others, Swift was, on August 19th, 1742, found to be "a person of unsound mind and memory and not capable of taking care of his person." (Swift's "Correspondence," Ball. vi. pp. 150 and 179; Banks, "Dublin Quarterly Journal of Medical Science," New Series, vol. xxxi, p. 83.)

THE CONQUEST OF THE ATLANTIC BY AIR.

Extraordinary care is, of necessity, devoted to every detail in the equipment of aeroplanes and airships for such epoch-making journeys as the Transatlantic Flight. It is interesting, therefore, to note that every aeroplane, seaplane and airship which has crossed, or attempted to cross, the Atlantic was equipped with "Tabloid" First-Aid. The reason is explained in Sir John Alcock's report:

"They are the only possible medical equipments for airmen."

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ended Saturday, October 4, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, October 4, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 14.9 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, October 4, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 14.9 and 14.6; Dublin Registration Area, 15.7 and 15.1; Dublin City, 16.1 and 15.5; Belfast, 13.9 and 14.0; Cork, 18.4 and 16.3; Londonderry, 17.8 and 14.3; Limerick, 13.5 and 15.2; and Waterford, 17.1 and 15.2.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, October 4, 1919, were equal to an annual rate of 2.1 per 1,000. Among the 107 deaths from all causes in Belfast were 3 from diarrhœa. Among 6 deaths from all causes in Galway was 1 death from enteric fever. The deaths from all causes in Kilkenny include 1 death from whooping-cough.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended October 4, 1919, amounted to 199—99 boys and 100 girls, and the deaths to 134—57 males and 77 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 12) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 15.7 per 1,000 of the population. The rate for all deaths registered during the forty weeks of 1919 ended October 4, was 24.3, while in the corresponding period of the preceding ten years, 1909-1918, it had been 22.2.

The 122 deaths appertaining to the Area included 2 from scarlet fever, and 8 from diarrhœa and enteritis of children under 2 years, and 1 from diphtheria. There were 2 deaths from influenza. In the three preceding weeks deaths from this last cause in the Registration Area had numbered 0, 1 and 0, respectively; deaths from scarlet fever numbered 0, 1 and 1; from diphtheria 1, 1 and 0; from diarrhœa and enteritis of children under 2 years old, 7, 9 and 9.

Deaths attributed to pneumonia were 6 in number (comprising 4 from broncho-pneumonia and 2 from pneumonia, type not distinguished). In the three preceding weeks the deaths from pneumonia had numbered 7, 5 and 5.

Tuberculosis caused 21 deaths as against 17, 12 and 12 respectively, in the three weeks preceding. Of the 21 deaths ascribed to tuberculosis, 14 were referred to pulmonary tuberculosis, and 7 to other forms of tuberculosis.

Ten (10) deaths were caused by cancer, 10 by organic diseases of the heart, and 8 by bronchitis.

Among the deaths of infants under one year old, 1 was referred to convulsions; 6 were due to diarrhœa and enteritis; 3 to premature birth, and 4 to congenital debility.

Thirty-one of the deaths appertaining to the Area registered during the week were of children under 5 years of age, 20 being of infants under one year, of whom 7 were under one month old. Thirty-four (34) deaths of persons aged 65 and upwards were registered, including 21 deaths of persons of 70 years or upwards.

Of the 122 recorded deaths 42 occurred in hospitals and other public institutions.

There were 2 accidental deaths, of which 1 was due to drowning.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended October 4, 1919, and the cases under treatment at its close, respectively, were as follow:—Enteric fever, 6 and 24; typhus, 0 and 0; measles, 0 and 20; scarlet fever, 40 and 132 (exclusive of 21 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 12 and 26. Five (5) cases of pneumonia were admitted during the week, and 13 remained under treatment at its close. Of the deaths in hospital recorded during the week, 2 were from scarlet fever, and 2 from diphtheria.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, October 4, 1919, in 96 large English towns (including London, in which the rate was 12.3) was equal to an average annual death-rate of 12.0 per 1,000 persons living. The average rate for the 16 principal towns of Scotland was 10.8 per 1,000, the rate for Glasgow being 10.1, and that for Edinburgh 10.1.

Vital Statistics.

For four weeks ended Saturday, November 1, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, November 1, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 15.2 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, November 1, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 15.2 and 14.5; Dublin Registration Area, 17.8 and 15.7; Dublin City, 18.5 and 16.7;

Belfast, 15.0 and 14.3; Cork, 16.3 and 17.5; Londonderry, 16.5 and 16.2; Limerick, 10.8 and 12.5; and Waterford, 17.1 and 13.8.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, November 1, 1919, were equal to an annual rate of 1.4 per 1,000. Among the 115 deaths from all causes in Belfast were 1 from enteric fever, 1 from measles, 11 from scarlet fever, 1 from whooping-cough, 1 from diphtheria, and 2 from diarrhœal diseases. Of the 24 deaths from all causes in Cork, 2 were from diphtheria; and one of the 13 deaths recorded in Londonderry was from diphtheria.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended November 1, 1919, amounted to 233—120 boys and 113 girls, and the deaths to 149—73 males and 76 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 11) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 17.8 per 1,000 of the population. The rate for all deaths registered during the forty-four weeks of 1919 ended November 1, was 23.6, while in the corresponding period of the preceding ten years, 1909-1918, it had been 22.2.

The 138 deaths appertaining to the Area included 1 from measles, 1 from scarlet fever, 2 from diphtheria, 2 from dysentery, and 5 from diarrhœal diseases. There was 1 death from influenza. In the 3 preceding weeks, deaths from scarlet fever had been 1, 0 and 0; from diphtheria, 1, 0 and 1; deaths from dysentery, 2, 11 and 0; deaths from diarrhœal diseases, 9, 7 and 3; and deaths from influenza 2, 0 and 2, respectively.

No deaths from measles had been registered in the three preceding weeks.

Deaths attributed to pneumonia were 5 in number (comprising 2 from broncho-pneumonia, and 3 from pneumonia, type not distinguished).

Tuberculosis caused 19 deaths as against 20, 15, and 22, respectively, in the three weeks preceding. Of the 19 deaths ascribed to tuberculosis, 15 were referred to pulmonary tuberculosis, and 4 to other forms of tuberculosis.

Twelve (12) deaths were caused by cancer, 21 by organic diseases of the heart, and 14 by bronchitis.

Among the deaths of infants under one year old, 3 were due to convulsions, 3 to diarrhœa and enteritis, 1 to broncho-pneumonia, 5 to premature birth, and 3 to congenital debility.

Twenty-six of the deaths appertaining to the Area registered during the week were of children under 5 years of age, 18 being of infants under one year, of whom 10 were under one month old. Thirty-three (33) deaths of persons aged 65 and upwards were registered, including 27 deaths of persons of 70 years or upwards.

Of the 138 recorded deaths 57 occurred in hospitals and other public institutions.

There were 4 accidental deaths, and 1 case of suicide.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended November 1, 1919, and the cases under treatment at its close, respectively, were as follow: Enteric fever, 1 and 13; typhus, 0 and 0; measles, 2 and 3; scarlet fever, 38 and 228 (exclusive of 20 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 8 and 21. Seven (7) cases of pneumonia were admitted during the week, and 16 remained under treatment at its close. Of the deaths in hospital recorded during the week, 1 was from scarlatina, and 3 were from diphtheria.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, November 1, 1919, in 96 large English towns (including London, in which the rate was 14.3) was equal to an average

annual death-rate of 12.9 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 12.4 per 1,000, the rate for Glasgow being 11.7, and that for Edinburgh 14.1.

A wide-spread epidemic of scarlet fever prevailed in London and Edinburgh, as well as in Belfast and Dublin; but the type was not severe and the death-rate was small.

METEOROLOGY.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of October, 1919.

Mean Height of Barometer, - - -	30.220 inches.
Maximal Height of Barometer (9th, at 9 a.m.),	30.567 ,,
Minimal Height of Barometer (1st, at 9 a.m.),	29.337 ,,
Mean Dry-bulb Temperature, - - -	47.6°.
Mean Wet-bulb Temperature, - - -	45.8°.
Mean Dew-point Temperature, - -	43.7°.
Mean Elastic Force (Tension) of Aqueous Vapour,	0.286 inch.
Mean Humidity, - - - - -	87.1 per cent.
Highest Temperature in Shade (on 6th), -	66.4°.
Lowest Temperature in Shade (on 28th), -	32.0°.
Lowest Temperature on Grass (Radiation) (28th)	26.9°.
Mean Amount of Cloud - -	54.8 per cent.
Rainfall (on 15 days) - -	2.366 inches.
Greatest Daily Rainfall (on 23rd), - -	1.250 ,,
General Directions of Wind, - -	N.W., N.E., calm.

Remarks.

October, 1919, was a dry cool month, with an unusually high mean atmospheric pressure of 30.220 inches (1023.4 millibars) and a great and persistent prevalence of northerly (between N.W. and N.E.) winds. Of the total rainfall (which was below the average by 0.314 inch) as much as 70.4 per cent. fell in 40 hours on the 23rd–24th, the measurement of those 40 hours being 1.667 inches.

The high atmospheric pressure was the more remarkable as the month opened with a deep depression centred off the north-west of the British Isles and in the very position subsequently occupied by a large anticyclone of singular staying power and in which the barometer rose to 30.71 inches

(1040 millibars). It was this latter system which threw a cold northerly or north-easterly current of air upon these Islands and France. The mean temperature of the week ended the 11th was 54.0°, that of the week ended November 1st fell away to 43.0°.

In Dublin the mean maximal temperature was 54.6°, compared with the average (55.1°), and the mean minimal temperature was 43.9°, compared with the average (44.8°). The arithmetical mean temperature (49.3°) was 0.7° below the average (50.0°). The mean dry-bulb readings at 9 a.m. and 9 p.m. were 47.6°. In the 50 years ending with 1915, October was coldest in 1892 (M. T. =44.8°), and warmest in 1908 (M. T. =55.4°) and 1912 (M. T. =54.9°). In 1918 the M. T. was 49.3° as in the present year.

The mean height of the barometer was 30.220 inches, or no less than 0.380 inch above the corrected average value for October—namely, 29.840 inches. The mercury rose to 30.567 inches at 9 a.m. of the 9th, having fallen to 29.337 inches at 9 a.m. of the 1st. The observed range of atmospheric pressure was therefore 1.230 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 47.6°, or 6.5° below the value for September, 1919. Using the formula, *Mean Temp.* = *Min.* + (*Max.* — *Min.*) × 0.485, the mean temperature was 49.1°, or 0.7° below the average mean temperature for October, calculated in the same way, in the thirty-five years, 1881-1915, inclusive (49.8°). The arithmetical mean of the maximal and minimal readings was 49.3°, compared with a thirty-five years' average of 50.0°. On the 6th the thermometer in the screen rose to 66.4°—wind, W.S.W.; on the 28th the temperature fell to 32.0°—wind, N.W. The minimum on the grass was 26.9°, also on the 28th.

The rainfall was 2.366 inches on 15 days. The average rainfall for October in the thirty-five years, 1881-1915, inclusive, was 2.680 inches, and the average number of rain-days was 18. In 1880 the rainfall was very large—7.358 inches on, however, only 15 days; in 1875, also, it was 7.049 inches on 26 days; in 1916, 5.951 inches fell on 24 days. On the other hand, in 1904, only 0.454 inch was measured on 11 days.

In 1890 only 0.639 inch fell on 11 days, in 1884 only 0.834 inch fell on 14 days, and in 1868 only 0.856 inch on 15 days. In 1917, the October rainfall was 2.600 inches on 24 days, and in 1918, 2.356 inches fell on 21 days.

High winds were noted on only 2 days, and never attained the force of a gale (8). Slight fog occurred on the 3rd, 5th, 11th, 21st, 23rd and 30th. A solar corona was seen on the 20th; a lunar corona on the nights of the 12th and 13th. There was a lunar halo on the 3rd. There was a fine aurora borealis on the evening of the 1st.

The rainfall in Dublin during the ten months ending October 31st was 19.679 inches on 164 days, compared with 21.743 inches on 179 days in the corresponding period of 1918, 25.071 inches on 163 days in 1917, 30.123 inches on 190 days in 1916, 24.979 inches on 169 days in 1915, 17.071 inches on 152 days in 1914, only 12.366 inches on 123 days during the same period of ten months in 1887 (the "dry year"), and a thirty-five years' (1881–1915) average of 22.220 inches on 162 days.

At the Normal Climatological Station in Trinity College, Dublin, the observer, Mr. A. W. Boyce, returns the mean atmospheric pressure as 30.225 inches; highest, 30.554 inches at 9 a.m. of 9th, lowest, 29.360 inches at 9 a.m. of 1st.

The arithmetical mean temperature was 49.5°, the mean dry-bulb reading at 9 a.m. and 9 p.m. being also 49.2°. Rainfall, 2.142 inches on 14 days, greatest in 24 hours, 1.01 inches, on 23rd. The number of hours of bright sunshine was 87.3; daily average, 2.8 hours. On the 14th there were 7.5 hours, and on the 15th 7.0 hours. At 9 a.m. the mean earth temperature was 51.2° at a depth of one foot and 53.1° at a depth of 4 feet. The lowest temperature on the grass (terrestrial radiation) was 23° on 28th. The highest temperature in the shade was 69° on 4th; the lowest was 32° on 27th, 28th, and 29th. The mean maximum was 56.0°, the mean minimum was 42.5°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J.

Pilkington, Stirling, Clonee, Co. Meath ; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin ; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin ; Mr. F. Dudley Joynt, Donnybrook, Dublin ; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin ; Dr. Arthur S. Goff, Dundrum, Co. Dublin ; Mr. W. J. McCabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin ; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow ; Miss Maude Moore, Blairfinde, Greystones ; Dr. C. Denys Hanan, M.D., Royal National Hospital, Newcastle, Co. Wicklow ; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare ; Mrs. E. Davis, Castleconnell, Co. Limerick ; Mr. E. W. Montagu Murphy, Ballinamona, Cashel, Co. Tipperary ; and the Rev. Canon Arthur Wilson Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 2.29 inches, on 15 days. Average, 2.94 inches on 17 days. Maximum in 24 hours, 1.14 inches on 23rd. Rainfall since January 1, 19.30 inches on 163 days. Average, 23.82 inches on 155 days. Max. temperature in shade, 68.0° on 6th ; min. 31.0 on 28th.

Malahide.—Rainfall, 2.015 inches, on 10 days. Maximum, 0.97 inch on 23rd.

Clonee.—Rainfall, 2.45 inches, on 11 days. Maximum, 1.16 inches on 23rd. Rainfall since January 1, 22.13 inches, on 165 days.

Phœnix Park.—Rainfall, 2.075 inches, on 10 days. Maximum, 0.992 inch on 23rd. Bright sunshine, 115.2 hours, including 8.7 hours on the 16th.

Cheeverstown.—Rainfall, 1.88 inches on 13 days. Maximum, 0.94 inch on 23rd.

Donnybrook.—Rainfall, 2.305 inches, on 13 days. Maximum, 1.200 inches on 23rd.

Ranelagh.—

Mean corrected Height of Barometer, - -	30.223 inches.
Highest corrected Reading (9th, 9 hrs.), -	30.57 ,,
Lowest corrected Reading (1st, 9 hrs.), -	29.34 ,,
Mean Dry-bulb Temperature, - - -	48.0°.
Mean Wet-bulb Temperature, - - -	46.6°.
Mean Vapour Pressure, - - -	.302 inch.

Mean Humidity, - - - -	91 per cent.
Mean Maximal Temperature, - - -	55.9°.
Mean Minimal Temperature, - - -	42.8°.
Arithmetical Mean Temperature, - -	49.4°.
Highest Temperature in Screen (6th), - -	72°.
Lowest Temperature in Screen (28th), -	31°.
Lowest Temperature on Grass (28th), - -	21°.
Nights of Ground Frost, - - -	7
Rainfall (on 13 days), - - - -	2.53 inches.
Greatest Daily Rainfall (23rd), - -	1.46 ,,
Mean Amount of Cloud, - - -	62.4 per cent.
Days of Clear Sky, - - - -	5
Days of Overcast Sky, - - -	13
General Directions of Wind, - - -	N., N.W., N.E.

Remarks.—A dry favourable month, without much wind; but with considerable extremes of temperature, the maximum in the screen exceeding 70° on two days in the first week, while being generally under 50° in the last week. Nearly all the rainfall fell between the 22nd and 24th. The barometer was generally high.

Dundrum.—Rainfall, 2.44 inches, on 17 days. Maximum, 1.37 inches on 23rd. Temperature ranged from 67° on the 6th to 33° on the 28th. Mean temperature, 49.0°.

Killiney.—Rainfall, 2.10 inches, on 9 days. Maximum 1.30 inches on 23rd. Average (24 years), 2.985 inches on 15 days.

Greystones (Rathdown House).—Rainfall, 2.15 inches on 15 days. Maximum, 1.25 inches on 23rd.

Greystones (Blairfinde).—Rainfall, 1.54 inches on 10 days. Maximum, 0.90 inch on 23rd.

Newcastle.—Rainfall, 2.12 inches on 14 days. Maximum, 1.15 inches on 23rd. Mean temperature, 48.9°; maximum 72° on 4th; minimum, 34° on 10th and 28th; mean maximum, 55.2°, mean minimum, 42.6°.

Ennistymon.—Rainfall, 1.07 inches on 9 days. Maximum, 0.43 inch on 22nd. The rainfall was 3.83 inches below the average for 20 years.

Cashel.—Rainfall, 0.98 inch on 13 days. Maximum, 0.36 inch on 22nd. The driest October since 1904.

Castleconnell.—Rainfall, 0.75 inch on 5 days. Maximum 0.50 inch on 22nd.

Dunmanway.—Rainfall, 1.18 inches on 13 days. Maximum 0.38 inch on 22nd. The observer writes:—"The lowest rainfall in any October in 16 years, and 5.37 inches below the average. It was a cold month, with frequent night frosts, especially severe on October 28th and 31st. No rain fell after the 23rd. Very warm on the 6th and 7th, and mild from the 2nd to the 8th, and from the 16th to the 22nd; the last 8 days were very cold, but there was bright sunshine every day. The frost of October 28th withered the potatoes, which were still green."

POST-OPERATIVE GASTRO-INTESTINAL HÆMORRHAGE.

This serious sequela may be encountered after any surgical interference, no matter of what nature, writes the *Medical Record* (January 25, 1919). It is more prone to occur after abdominal operations, particularly when the interference has been for some lesion of the digestive tract. The most common ætological factor is a local or general infection. The prognosis of post-operative gastro-intestinal hæmorrhage is subordinated to both the amount of blood lost and the gravity of the concomitant symptoms. A very reserved prognosis should be made, because out of 249 cases reported by Fourdinier, death occurred in 130; a mortality of 52 per cent. Purves found a mortality of 72.5 per cent., while Russe came by a mean death-rate of 55 per cent. These hæmorrhages especially demand a reserved prognosis when they arise after operations not involving the digestive tract; and, out of a total of fifteen cases of extra-abdominal operations where this complication occurred, fourteen patients died. Surgical treatment is occasionally indicated, but usually the care of these cases remains strictly medical. In certain circumstances prophylactic measures should be carried out to forestall the possible occurrence of a post-operative gastro-intestinal loss of blood.

PERISCOPE.

THE WASSERMANN TEST.

Dr. T. T. Thomson (New Zealand Medical Journal, vol. xviii, No. 85), in his Notes on the Diagnosis of Syphilis, writes:—"Owing to the great trust put in the Wassermann reactions, the clinical side of the disease (syphilis) has been somewhat neglected, and in many cases the negative Wassermann was taken as an indication of freedom from the disease. Given the history of a sore when would one expect a positive Wassermann. . . It is now agreed that at least three months from the date of appearance of a sore should elapse before any value can be placed on a negative Wassermann."

And he further adds, certain diseases will cause a positive Wassermann, this is particularly so in the case of frambœsia (Treponema pertenue). "A positive reaction has also been given in cases of leprosy, relapsing fever, malaria, scarlet fever, pellagra, late tuberculosis, diabetes mellitus, typhoid fever, and in some malignant diseases. Scarlet fever gives about five per cent. of positives, and is the most active in this connection." The author further directs attention to the positive reaction in cases of psoriasis, urticaria, pigmentosa and erythema iris. These cases sometimes give a positive Wassermann, and from a cursory clinical examination a wrong diagnosis may be made. As to the frequency of a positive Wassermann in the spinal fluid, the figures from Rochester Row (biological laboratory) show: six positives in 36 primary cases, 87 positives in 185 secondary cases, and 21 positives in 65 tertiary cases. Cases of general paralysis of the insane showed about 100 per cent. of positive Wassermann. The diagnostic value of the Wassermann test is lessened by Thomson's statement that in a case of rampant secondary, in which the spirochætæ were demonstrated in a papular rash, the serum was tested in three independent laboratories, and all returned a negative reaction.

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ONE HUNDRED AND FORTY-EIGHTH VOLUME.

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